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TRANSACTIONS

OF THE

18387

NEW YORK

MEDICO-CHIRURGICAL SOCIETY

THE PRESENT VOLUME INCLUDES THE TRANSACTIONS OF THE SOCIETY, AS TAKEN FROM THE SECRETARY'S RECORDS, FOR THE YEAR 1884. PAPERS ARE PRESENTED IN THE FORM READ BEFORE THE SOCIETY.

CLARENCE E. BEEBE, A.M., M.D.,
Editor.

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TRANSACTIONS OF THE NEW YORK MEDICO-CHIRURGICAL SOCIETY.

1884.

Annual meeting, January 8th, 1884.

Dr. E. P. Fowler in the chair.

Subsequent to the transaction of the routine business incidental to an annual meeting, the election of officers took place. The result has already been published in Vol. III., Society's Transactions, Appendix A, page 120, *et seq.*

The following report from the Committee on "Therapeutical Hints," appointed at the last meeting, was presented, accepted and adopted.

Mr. President and Gentlemen:

Your committee, to which was referred the project of *Dr. Searle* in regard to "Therapeutic Hints," beg to report as follows:

First. We recommend the appointment by the President, of an Editor, who shall have charge of the matter. He shall call upon the members of the Society for the contribution of items of this character, which shall be sent to him and by him arranged. He shall present the same to the Society for discussion and approval or rejection. Such items as may be approved by the Society he shall preserve as the property of the Society.

Second. Having completed this work, in alphabetical order, he shall hold the results subject to the disposal of the Society.

Third. One half hour of each session shall be devoted to the presentation and discussion of these therapeutic hints, and your

committee would recommend the last half hour, from 9.30 to 10 P.M., as the most suitable for the purpose, because of the greater number of members likely to be present at that time.

Fourth. Your committee are of opinion that, with the hearty concurrence of the members of the Society, this portion of our meetings and our work can be made extremely interesting and valuable.

Signed,

W. S. SEARLE, } *Com.*
JOHN BUTLER, }

By vote of the Society, the reading of *Dr. Sterling's* paper was deferred to the February meeting.

Stated meeting, February 12, 1884.

President Searle in the chair.

Prior to the presentation of formal papers, the President made some very pertinent remarks regarding the importance, to the interests of the Society, of a greater activity upon the part of its standing committees. The work accomplished by said committees in the past has proved of but negative value, and the time has come when the opportunities for obtaining greater results in medical investigation and scientific research can no longer be neglected without serious detriment accruing to the Fellows of the Society in particular and to the medical profession at large. Special stress was placed upon the vast field of work which has of late opened up to the Committee on Public Health. The first paper of the evening was then read by *Dr. Chas. F. Sterling*, on "A New Method of Operative Relief in Cases of Chronic Catarrhal Otitis Media."

It has long been recognized by aurists, that among the most difficult cases, to satisfactorily treat and obtain any measure of success, is that form of deafness known as chronic catarrh of the middle ear, or, by its synonyms, "nervous deafness," "hypertrophic or proliferous inflammation," "sclerosis of the drum-head," etc. Roosa says, after giving some statistics: "These statements show that we have not as yet * * * found the remedy for the class for which we

in America are most anxious—old and neglected cases of chronic proliferous inflammation," and, again, that "we are chiefly anxious to enlarge our therapeutic means for the cases of persons who are more than sixteen years of age, and especially for those who are adults in middle life." The unsatisfactory results of treatment in this class of cases is due both to the insidious character of the process, whereby it often has reached a stage almost hopeless before the patient fairly realizes the seriousness of his condition, and too late seeks advice, and from the extreme difficulty of operating or applying local treatment, on account of the inaccessibility of the part affected and its diminutive size. It is on account of the failure of the means now at our disposal that I offer the suggestions contained in the present paper. Allow me to briefly review the pathological conditions present, that the inadequacy of the means now employed may be better understood, and that a basis may be established to show why the means proposed for the relief of some of these inveterate cases offer a chance of success.

Chronic catarrhal inflammation of the middle ear originates either in a succession of acute attacks, each of which leaves its traces, or more frequently of sub-acute attacks, lasting but a short time, and receiving little attention, or most frequently of all, in consequence of catarrhal affections of the naso pharynx and adjacent tissues, whereby the Eustachian tubes become closed and their function of maintaining the equilibrium of atmospheric pressure in the tympanum with the outside air ceases. In all of these cases the ultimate results are of the same character, *viz.:* a congestion, an increased secretion, the drying and hardening of the same, the development of connective tissue or bands of adhesion, hypertrophy of the mucous lining, the impairment of the free motion of the ossicles, the pressure of the outside air upon the membrana tympani, driving it inwards, increasing the pressure of the stapes on the labyrinthine fluid, producing annoying tinnitus, and the lack of response to sound vibrations in the atmosphere. Almost without exception these cases still present unimpaired power of the auditory nerve, showing that right here in the cavity

of the tympanum lies the trouble. Now the problem confronting the aurist is how to get the sound waves from the external ear to the labyrinth, where the auditory nerve filaments are waiting to receive them and convey them to the brain. To accomplish this, various means have been employed by aurists and a number of operations devised, some of which have been followed by fairly good results, and in other cases the results have been negative. In regard to these procedures I quote from Burnett: "Various forms of incision and excision of the membrana tympani for the relief of hardness of hearing, not dependent on accumulations of fluid in the tympanum, but upon chronic thickening, hardening, stiffening and retraction of the membrana tympani and other parts of the sound conducting apparatus of the middle ear, have been proposed by several authorities. The operations about to be named have been undertaken with no empirical intent, but with a knowledge of a clearly diagnosed condition of the auditory apparatus. This must be said of them as pre-eminently distinguishing these from previous operations on the drum-head." These remarks apply to certain operations proposed and executed by aural surgeons of a comparatively recent period, which I shall refer to later. A brief résumé of the history of operations on the membrana tympani and in the tympanic cavity may not be out of place, fuller accounts of which can be found in Roosa's work and in Burnett's. In 1650 Johannes Riolanus, of Paris, proposed the operation of incising the membrana tympani, but did not perform it. In 1722 Thomas Cheselden, of London, operated on dogs. In 1760 a charlatan named Eli performed the operation on the human subject. In 1800 Sir Astley Cooper and Dr. Carl Himly both proposed it, and 1806 the latter performed it on the living subject. The difficulty in all these operations is the inveterate tendency of the membrana tympani to close. To remedy this bougies were introduced, but the reaction was too great. Then a gold tube was introduced. In 1868 Politzer adapted an eyelet to the puncture, which operation is still occasionally resorted to. Voltolini used the galvano-cautery to make the opening, and it remains patent longer than after cutting operations. He also

encircled the manubrium with a ring of gold wire, but necrosis of the bone resulting, he substituted aluminium as being of less specific gravity. Wieden, of St. Petersburg, in 1867, advocated the removal of a portion of the malleus handle, claiming that from the large blood supply about the manubrium, if it were removed, there would be less regenerative material furnished. In 1868 Weber Liel proposed tenotomy of the tensor tympani and devised instruments for the purpose. Dr. Prout, of Brooklyn, after incising the membrane, divides adhesions with a special knife. Hinton, of London, divides the membrane and treats dried accumulations with fluid injections. Of all these operations, perhaps Weber Liel's division of the tensor tympani has attracted the most attention, and has been performed many times. "The indications for this operation are the permanent retraction of the tensor tympani muscle, indrawing of the membrana tympani and chain of ossicles, with a consequent increased intra-labyrinthine pressure." "The latter may produce, besides tinnitus and deafness, gradual atrophic alterations in the terminal filaments of the auditory nerve." Kessel and Politzer have endeavored to relieve the anchylosis of the foot plate of the stapes in the oval window by removal of the bone, but it has proven almost impossible to dislodge it. To accomplish the result sought for by Weber Liel's operation, I now propose another, which is easier of execution, attended by no more risk, if as much, and has advantages in certain cases which Weber Liel's operation lacks.

This operation consists in the resection of the long process of the incus. I am aware that, in the present advanced condition of aural knowledge, any new procedure must have good grounds for its proposal, that it may not come under the stigma of being undertaken with an empirical intent, but rather classed with other operations before referred to as having a definite aim and object, and undertaken with a clearly diagnosed condition of the auditory apparatus.

Therefore let me go back to the pathological conditions before spoken of and show why this may relieve the patient. Among the results of chronic catarrhal inflammation of the middle ear

is one well recognized condition, and yet, in the operations undertaken for the relief of such cases, this particular feature does not seem to me to have been considered in proportion to its importance. I refer to the anchylosis of the malleo-incudal joint. In the recently published edition of Politzer's text-book is the remark, "Of special interest are the alterations in anchylosis of the articulation of the malleus and incus." This complex and delicate piece of mechanism, it would naturally seem, would be among the first portions of the middle ear to become affected by the catarrhal process, resulting in the drying of the natural moisture, and from the attachment of bands of adhesion on account of the prominence of its component parts. Inasmuch as the function of conduction by the ossicles depends largely on the integrity of this joint, it follows that with its impairment a corresponding loss of function occurs. From its complex character a very slight change in its normal surroundings would suffice to impair its mobility, and I confess to the belief, that could inspection of the tympanic cavity be made in that stage of the chronic catarrhal process, when patients first commence to notice the change in their function of audition, this joint would be found proportionately more affected than any other portion of the conducting apparatus. Admitting, then, the anchylosis of this joint, the question is legitimately raised, what is the functional necessity for the continuity of the chain of ossicles?

It is a fact as well known as any other in otology that the incus in suppurative cases frequently is completely lost, and yet the patient continues to have a good degree of hearing even after the suppuration has ceased—far better, in fact, than in very many cases of chronic catarrh. I think otologists are agreed in the opinion that in such cases the stapes still exerts its function of conveying impulses to the labyrinth (though how it receives them is not understood). The fact remains, however, that impressions are conveyed to the labyrinth without the incus—which is all I desire to establish at present. Another condition, resulting from this anchylosis of the malleo-incudal joint, is its positive injury to the function of the labyrinth. No argument is needed to show

this, as it is a fact acknowledged by all aurists. The vacuum existing in the tympanum, and the consequent atmospheric pressure on the drum-head, forces it inward, and the immobility of this joint, of course, conveys the constant pressure directly to the labyrinthine fluid. This, as before referred to, "may produce, besides tinnitus and deafness, gradual atrophic alterations in the terminal filaments of the auditory nerve." Not only the possibility of nerve changes is to be considered, but the very annoying tinnitus, due to the increased pressure, is a very important fact. That this unpleasant symptom may be due to pressure alone, as well as congestion, hyperæsthesia of the nerve, the positive objective noise of the circulation, etc., is, I think, conceded by all. Now this tinnitus in itself, aside from its unpleasantness, is a factor in impairing the perception of sound by masking and confusing sound impressions, thus rendering still worse the already impaired hearing. The dizziness so frequently met with has its origin in the same pressure, therefore it is fair to conclude that, by relieving the pressure, two very decided conditions for which patients seek help may, in many cases, be either removed or modified. That this is the case, the results of puncturing the drum-head and tenotomy of the tensor tympani have frequently shown. I shall refer to this point again. There is another feature present in many cases of chronic catarrhal otitis media which has attracted much attention from aural specialists, *viz.*, the fact of many persons suffering from this disease hearing better in a noise. This has been challenged as a fact by Dr. Holt; but, notwithstanding the results of his investigations and his conclusions, however many may be the subject of self-delusion, I think it will be admitted that there are undoubted cases on record where it actually was so. Now that one single positive fact will offset any number of negative facts is a recognized maxim. Many explanations have been adduced to account for this; but, however they may differ in their premises, they all unite in the conclusion that the necessary condition is to get the stapes in motion. I think it may safely be asserted, that with unimpaired nerve power, if normal vibrations or excursions of the stapes can be brought about, normal hearing will result, other things being

equal. Now the difficulty in accomplishing this result is ordinarily ascribed to more or less immobility of the foot plate of the stapes in the oval window, and the gist of all the explanations referred to, is that the larger and heavier sound waves, overcoming this stiffness, set it in motion, when it then becomes able to recognize or take up the finer vibrations from speech, etc. Here, too, I think, an error has been made in not allowing a sufficient influence to the rigidity of the malleo-incudal joint. Helmholtz has shown that the excursions of the stapes are no more than from the eighteenth to the fourteenth part of a millimetre. Supposing, for a moment, that a case exists in which there is normal mobility of the stapes—by which I mean no anchylosis of the foot plate, but a rigid malleo-incudal joint, and a depressed membrane. It is at once perceptible that those very small excursions are prevented from taking place, and practically the result is the same as if rigid anchylosis of the stapes were present. Now if the stapes could be freed from its connection with the other ossicles, it is apparent that its excursions could occur if the impulse could be given to it. It is not the purpose of this paper to attempt to explain how this impulse can be or is given to the stapes. As I have before stated, that impulses are given to the stapes and labyrinth in cases where the incus has been destroyed is an accepted fact. We are now in a position to advance the following propositions: First, that a fair degree of hearing is possible without the incus. Second, that the tinnitus due to pressure makes worse an impaired hearing. Third, that the tinnitus and dizziness due to pressure may be relieved if the pressure can be removed. Fourth, that the immobility of the malleo-incudal joint, in connection with a depressed membrane, makes this pressure constant. Fifth, that this rigid joint and depressed membrane produce the same result as if the stapes were anchylosed. Sixth, if the pressure on the stapes can be removed, it is in a condition to transmit the impulses it may receive according to the amount of mobility it may still possess.

Now let us suppose an ordinary case of chronic catarrh of the middle ear. We find the depressed membrane, the rigid

malleo-incudal joint, the pressure on the labyrinth, with the attendant tinnitus and dizziness, and a certain amount of mobility of the stapes, as shown by hearing better in a noise. Now let us suppose a break in the continuity of the ossicles to occur, by the absence of the incus. We know the hearing will be no worse, for we have already shown the power of the stapes to receive and transmit sound waves in its absence. The tinnitus and dizziness will be relieved, for the pressure is no longer exerted, and whatever hearing power was present will be improved by just the amount that the tinnitus present before interfered with sound perception, plus the increased mobility given to the stapes. From this it can be seen that in a hypothetical case the presence of the incus is not necessary, and theoretically its absence a positive benefit. Now the questions arise, how can this be accomplished? how practical is the operation? what are its advantages over other operations, and what are its disadvantages? Now a few words in regard to the general method of the operation. In many normal ears the membrana tympani is so translucent that through it may be distinctly seen the long process of the incus curving downwards posterior to the manubrium. This position of the bone is fairly constant, even in cases where considerable distortion of the manubrium is present from depression of the membrane. From the nature of its attachments there cannot be any very great displacement. Let, then, an opening be made through the drum-head, posterior to the manubrium and commanding a view of this process. The galvano-cautery would be the best means of accomplishing this. Through this perforation let a pair of specially adapted cutting forceps be introduced, and seize the long process of the incus at some point between the body of the bone and its articulation with the stapes. The bone being very porous and slender can then readily be divided, and the operation is completed. I shall specify the detail more minutely later on.

Now what has been accomplished by this operation over others which have been proposed and executed? In the first place, whatever advantages are derived from an opening in the mem-

brana tympani, are also present in this case, for the perforation is a necessary step. The pressure on the labyrinthine fluid is completely removed, and should the opening in the drum-head become closed, as openings there have a habit of doing, the pressure is not renewed. Compared with the operation for severing the tendon of the tensor tympani, it has the following points of superiority: In the first place, everything to be done is in a direct line and in plain sight. There is no attempt to seize something around a corner that cannot be seen. In regard to this point Dr. Roosa remarks parenthetically on Weber Liel's operation: "Just how the operator is to know when the hook is around the tendon I am unable to learn," etc. There is no danger of wounding the chorda tympani nerve, or any other portion of the tympanic cavity. The operator can see exactly what he is doing from beginning to end. If all the pressure on the stapes were due to the traction of a shortened tensor tympani, or to the atmospheric pressure on an imperforate membrane, severance of the tendon or repeated prickings of the drum-head would accomplish all that could be expected; but it has already been shown that anchylosis of the ossicular chain and bands of adhesion are factors in producing this pressure, and in those cases which are the most common, *viz.:* where all the factors of pressure are present, neither division of the tendon nor paracentesis of the membrana tympani will accomplish the desired result in relieving the pressure. Again, there is a doubt as to the position or direction of the tendon of the tensor tympani in any given case. Prof. Grüber, in discussing the operation of tenotomy, shows that this is not constant, and that its location, or direction, rather, is rendered still more indefinite by the variations in the retraction of the membrane and the displacement of the hammer; therefore the primary incision must be made, sometimes anteriorly, sometimes posteriorly, to the manubrium, and even then there is a large element of uncertainty. In the proposed operation, with judgment in the selection of cases, there need be no doubt as to where the opening should be made, or why Dr. Prout's operation of dividing adhesions between the

drum-head and the promontory would accomplish the desired end, if adhesions were the only cause of pressure—but they are only one of several. In this proposed operation, whatever be the cause of the pressure, whether atmospheric or adhesive bands, ossicular immobility or traction of the tensor tympani, as it all must be communicated through the long process of the incus, by this resection is destroyed the medium of communication. In Wreden's operation of removing a portion of the hammer handle, the sole object sought was to make the opening permanent, and even that proved unsuccessful. That the operation presents no great difficulty of execution is proven by the fact of Politzer, after several suppurative cases, having divided the long process with a pair of scissors and then pushed the upper end forward to prevent union. By the proposed resection, however, there is no chance of the bone reuniting, which seems very liable to happen after simple division; for, even if the extremities are separated, there is nothing to prevent their coming directly together again. Thus is seen the advantage gained over every other operation performed for the relief of cases suffering from chronic catarrhal otitis media. Now what are the disadvantages of this procedure? Probably in the tendency to suppuration. The incus, as before said, is the most porous of the ossicles, and most prone to be destroyed in a suppurative process; but the loss of the incus itself will be no serious matter, as already shown; and again the fact must be borne in mind, that as an iris, which has been the seat of repeated attacks of inflammation, bears operative procedure with much more tranquillity than one never affected, so will the dulled and thickened mucus lining of the tympanic cavity be much less prone to an obstinate suppurative process than if interference were attempted within a normal drum. In fact it is probable that the reaction following the operation would be that ordinarily attendant upon broken or divided bones, rather than a protracted suppuration. In any case the means at our disposal to-day for the control of the purulent process are much more efficient than when Wreden proposed his excision of the manubrium, and still farther we know that traumatic suppurations are more easily controlled than chronic ones in other por-

tions of the body, and why should the ear be an exception? Perhaps it is proper in this connection to revert to the excessive suppuration following Wreden's operation, and suggest that the excessive vascularity, to get rid of which was the theory of the operation, was, perhaps, the very cause of the intense reaction. Such conditions are not present in the proposed operation, either as cause or effect. Now to describe a little more in detail the operation. I would recommend, in the first cases, that one be selected with a wide meatus, thus giving more working room. Anæsthesia should be resorted to. A short and wide speculum should be introduced, and the galvano-cautery applied to the membrane posterior to the manubrium, as before explained. After accomplishing the perforation the instrument for resection is to be introduced. This may be constructed similarly to the ordinary scissor-handled angular forceps, but with some modifications. The handles should be longer, that there may be a greater leverage. The joint should be stronger. The parallelism of the blades should be vertical instead of horizontal. The extremities should be made spoon-shaped with cutting edges, that the section removed may be retained in the depression and not fall to the floor of the tympanum and act as a foreign body. Another instrument which would, perhaps, be better, would be a shaft sliding in a canula and ending in a broadened concaved hook, with cutting edges bearing against grooves in the end of the canula, working upon a similar principle to the snare. This would give a powerful cut, and, as all the strain would be tensile, could be made very delicate, and avoid the spring attendant upon long, slender blades and scissor joint. This section removed should be large enough that the callous thrown out may not reunite the ends of the bone. In dividing the bone it is essential that no traction whatever be made, as that would tend to dislodge the stapes, but all the force exerted must be applied directly against the opposing cutting edges. From what has been said it is apparent that the indications for the operation will be as follows: A permanent retraction of the membrana tympani, anchylosis of the ossicles, increased labyrinthine pressure,

as shown by tinnitus and dizziness, good bone conduction, hearing better in a noise, and a wide canal.

Until the operator becomes expert I would advise care in the selection of cases, both that he may have in his favor as many points as possible, and that the operation may not fall into disrepute by reason of its performance on unsuitable subjects. There are many patients seeking relief, of which I see instances nearly every day, presenting the characteristic features of chronic catarrh, which have not yet gone on to hopeless disorganization. These, however, under ordinary circumstances, are steadily passing on from bad to worse, and our present therapeutic measures offer little or no relief. I am inclined to think that in this class of cases will be found the field for the best results, and, if success is met with here, we may, with more confidence, look for its benefits in many now hopeless cases. It is not, however, enthusiastically advocated as a cure for every case of this obstinate trouble, but for a well-defined and easily recognized class. As such it is most respectfully submitted to the consideration of the profession. I hope to supplement this paper, at no distant date, by another, giving the experience met with in performing the operation both on the cadaver and the living subject.

In response to the invitation of the President, *Dr. Knapp* stated that in his opinion the proposition advanced in the paper was a very sensible one, and that in a certain class of cases much could be accomplished by its adoption. The most cogent argument against the procedure would be, in his estimation, the exceedingly short interval (two millimetres) between the incu-stapedal articulation and the course of the chorda-tympani nerve. No great harm could be anticipated from the exsection of the entire bone, as has been proved by the number of operations of this nature performed by Rossi.

Dr. Searle's experience had lead him to place great confidence in the employment of the compound tincture of iodine in cases of both catarrhal and suppurative otitis media. In the former variety he was accustomed to administer the drug in five drop doses, three times daily, until its beneficial influence upon the

pharyngeal mucous membrane has ceased to be experienced. He then directs it to be discontinued until the patient has caught a fresh cold. As soon as this occurs the use of the remedy is recommenced and actively pushed. The result has been, where this plan has been adopted, that the patient, instead of suffering from an augmentation of the deafness, the usual effect of a so-called *cold*, experiences a marked improvement in his hearing capacity. One should not expect to obtain perfect hearing in cases of such long standing as these generally prove to be when they come under observation, no matter what plan of treatment may have been instituted.

Dr. Knapp, in reverting to the operation suggested by *Dr. Sterling*, said that one objection to it, is the fact that to obtain the hoped-for result, it involved the necessity of the entire tympanic membrane remaining permanently open. Should this become closed, the medium of sound conduction would be destroyed and with it the capacity of hearing. Tinnitus and dizziness would unquestionably be very materially relieved.

The second paper of the evening was read by *Dr. Geo. S. Norton*, on "A Case of Abscess of the Brain, with Double Optic Neuritis, Caries of the Right Orbit and Orbital Cellulitis. Autopsy."

The relation existing between diseases of the brain and eye is one of so much interest to ophthalmologists, that all cases which tend to throw any light in this direction seem deserving of record. With this object in view the following case is presented.

William H., æt. twenty-two, was brought to my clinic, at New York Ophthalmic Hospital, from Rondout, N. Y., on April 27th, 1880. The history of his condition, as clearly as could be obtained, was as follows: His health had always been good until two years ago, when he was struck on the head with an ice-hook. For two weeks he was confined to the house; a portion of the time in bed. From this he rallied, and seemed to be perfectly well until last summer, when he began to suffer with severe headaches, which were almost constant. About Jan. 1st he came home from his work with a severe "cold and fever," which continued three days, when the right eye became very red. On the fourth day, the

right eye and corresponding side of the head were much swollen, and for one-half hour had "cramps all over," with great difficulty in breathing. For nine days these spasms of the muscles were experienced daily, at 10 A. M. and 6 P. M., after which they ceased until eight weeks ago, when they again made their appearance and lasted for thirty-six hours. It was then found that he was blind in the right eye; that he could not speak; and that the extremities were wholly or partially paralyzed. For four days he did not have a stool or pass his urine. During the past eight weeks he has had excessive thirst, especially at night, when he would drink eight quarts of water before morning. Three weeks ago the sight was lost in the left eye. On April 25th the convulsions returned.

Status præsens.—The patient lies helpless in bed; only slight movements of either arms or legs being visible. The lower jaw is fallen so that the mouth remains open; can only be closed by the action of the orbicularis oris, as the masseters seem to be totally paralyzed. He appears rational, and understands when spoken to, although it is with difficulty that he makes his wants known, owing to the loss of speech. No vision in the right eye, and only perception of shadows in the left. Examination of the right eye shows much swelling of the lids, some chemosis and prominence of the eyeball, and other symptoms of orbital cellulitis, together with suppuration of the whole cornea. At the edge of the orbit, near the outer canthus, is a fistula discharging pus. The right side of the head is also much swollen and hard, as we see it in periostitis. In the left eye no abnormal indications are manifest externally, with the exception of a dilated pupil. The refractive media are clear. The ophthalmoscope, however, reveals all the characteristic appearances of engorged papilla.

On the evening of April 28th, twitching of the muscles of the extremities was noticed and the patient complained of severe headache. The next day the spasmodic action had ceased, though the pain in eyes and head continued; the urine was passed involuntarily; the appetite was better, and the thirst less. Various remedies were administered, but with only temporary relief of

individual symptoms. No marked change in his condition was observed from this time to May 3d, when he became comatose, and died at 4 P.M.

Autopsy, twenty-two hours after death.—The post-mortem examination was made by Dr. F. E. Doughty, assisted by Dr. Chas. Deady, with the following results: The right temporal muscle was much swollen and œdematous. After removal of the skull-cap the surface of the brain (meninges) was found somewhat hyperæmic. The brain was now removed in its membranes. Inspection of the floor of the skull revealed a caries of the orbital plate of the frontal bone corresponding to the apex of the lesser wing of the sphenoid on the right side, causing a direct opening into the right orbital cavity. For some extent around, the bone was roughened. Upon opening the membranes at the base of the brain a large mass rolled out, dropping upon the floor. It was the shape of a kidney and nearly as large, being three inches in length, one and a half inches in width, and one inch in thickness. It proved to be a large sac of pus. The cyst wall was about two millimetres in thickness and very strong and tough. On making an incision through it, about one and a half ounces of thick, green, unoffensive pus escaped. Further examination showed that the right middle cerebral lobe had been wholly occupied by this tumor; no convolutions or indications of brain matter remaining. The anterior lobe of the cerebrum in the vicinity of the fissura Sylvii was somewhat softened, as was also, to a limited extent, the brain substance in connection with the tumor posteriorly. The fluid in the subarachnoid space as well as in the ventricles was a little more than normal.

Remarks.—A few points in this case are peculiar and seem worthy of special mention. The cause of the abscess in the brain is without doubt correctly assigned to the injury of the head two years previous to death, and about one year before the severe headaches were experienced. This interval between the injury and first appearance of cerebral symptoms is unusually long, though one case is recorded by Dr. Gull in which distinct symptoms of the cerebral disease did not appear until one year

after "a fall on the pavement." The relation existing between the disease in the brain and in the orbit is also of much interest in this case of mine. The orbital cellulitis was in all probability dependent upon the carious condition of the orbital walls, and was therefore secondary to the disease of the bone and brain. Which of the two latter was primary, is a question not easy of solution. The abscess in the brain was well encysted, and although in connection with the carious bone, no communication existed between the bone and sac, and no adhesions of the cyst with surrounding structures could be found. Dr. Gull also reports a case in which an abscess of the brain was associated with an orbital lesion; but in his case the abscess was not encysted, was caused by extension from an abscess in the orbit, and was in direct communication with the same. This complication of abscess of the orbit extending to the brain is nothing new, as the fact has long been recognized by ophthalmic surgeons, but to find the orbit secondarily involved is by no means common. The co-existence of optic neuritis is nothing remarkable, as it is usually present in cerebral diseases which produce increase of the intracranial tension, as tumors, abscesses, etc.

The speaker also presented the history of a patient with an atrophied eye-ball on the right side, who first came under observation during October, 1877. Two years prior to this date, he had complained of severe pain in the eye, associated with considerable inflammatory action. This was succeeded by hemorrhage into the eye, with symptoms of glaucoma, and this condition, in turn, by atrophy. The vision in the left eye was tested from time to time, the results of which procedure were presented in statistical form. The diagnosis, based upon the facts elicited, was given of glaucoma simplex. At an examination, made recently, the atrophied stump was found to be exquisitely sensitive to the touch, and the patient refused to have it removed. On February 10th, 1884, his consent was obtained and enucleation was performed. On examination of the eye-ball, the choroid was found to be metamorphosed into a substance re-

sembling bone. The question of particular interest is whether the glaucoma of the left eye could be attributable to sympathetic irritation. The generally accepted opinion is against such supposition. It would be certainly possible to have a secondary glaucoma, provided a predisposition to it can be proved beyond question to be present. In the case described no bony tissue was discovered in the ciliary processes. The specimen was exhibited by the speaker.

The third paper was read by *Dr. S. J. Donaldson*, on "Extirpation of an Interstitial Myo-fibroma of the Uterus."

The case which I have to report to you is one of uterine fibroid. I do not claim for it any specially unique pathological features, nor will I say that in its method of treatment will be found anything remarkable or original. My purpose in presenting it is merely to add one more to the list of cases, which, *à priori*, are extremely disheartening, but eventually afford the happiest results.

Miss G., aged thirty-two, presented herself at my office about the first of last November, bearing a note of introduction from Dr. E. P. Fowler. She gave the following history: Menstrual life was inaugurated in her fourteenth year; always regular, profuse and painful, lasting from six to eight days. In the summer of 1881 the menses became more frequent and irregular, and severe pain was experienced in the left infra-mammary region. She now began to notice a serous discharge from the vagina; the menses were more profuse and severe bearing-down pain was experienced. From that time until the winter of 1883 these symptoms gradually increased, appetite and strength depreciated and the flesh became more blanched. In January of 1883, was attacked with severe and obstinate flooding and persistent vomiting, which lasted three or four weeks. In compliance with the wishes of her physician and friends, she sailed in February for Florida, enjoyed the trip, and her general health was greatly improved by the climatic change. Returned to New York last May, when she first learned from Drs. Fowler and Minor that she was suffering from an uterine tumor. Through the summer she enjoyed a fair degree of health, but was very weak from the constant, excessive, pale-colored,

vaginal discharge; besides, the menses were more frequent, of longer duration and attended with colic-like pains. At the time of her first visit she is in that exsanguinated state so often witnessed in women suffering from uterine fibroids. The flesh is extremely blanched, and there is considerable puffiness under the eyes, which present that pearly whiteness peculiar to these cases. Local inspection reveals the uterus prolapsed, somewhat retroverted, enlarged and fixed. The os, strange to say, was very small; a probe passed four and a half inches within the uterus.

Dilatation of the canal was effected by a succession of sponge tents, which caused considerable pain and hemorrhage. The "touch" now diagnosed a firm, globular, interstitial growth in the posterior uterine wall. An incision about three inches long and from a fourth to three-eighths of an inch deep was made along the face of the protuberance, and a course of hypodermic injections of *ergot* instituted, with the hope that the uterine contractions thereby excited would force the tumor through the slit just made. Five drops of Squibbs' aqueous extract of *ergot*, mixed with *glycerine* and water—each five drops—were injected into the hypogastric tissues every third day for twelve days, when we were compelled to desist on account of the menses, which were quite profuse, and, besides, the suffering consequent upon the use of the *ergot* had still further impaired the physical condition. The tissues subjected to the syringe were also considerably swollen, inflamed, and abscesses threatened, but were subdued by frequent hot sponging. After ten or twelve days' non-interference, the os was incised and again dilated, when the track of the incision was found gaping sufficiently to contain the finger, and the submucous, parenchymatous structures were more bulging. The incision was deepened, and the injections of *ergot* resumed. About a week later the finger came in contact with the neoplasm protruding through the incision, and on the next examination it was found well advanced into the uterine cavity. By the use of the finger, a pair of hooked forceps and a strong steel sound, it was quite readily freed so that it seemed to be entirely within the cavity. The amount of *ergot* was doubled with the expectation of

forcibly extruding the mass; but after several days it was evident that no further progress was made, and the patient, who was now very much debilitated, was reluctant to undergo the torture inflicted by the use of the *ergot*. Although the tumor was free as far as the finger could reach, an attempt to rotate it with the forceps demonstrated that it was firmly attached to the fundus of the womb. As the flowing was now greatly diminished, I decided to devote a few days to upbuilding the patient's strength, and as soon as conditions were favorable to complete the extirpation by the aid of the écraseur. Accordingly, on the 27th day of January, with the assistance of Dr. Fowler, the patient was chloroformed, the uterus fully dilated, and the tumor snared and extracted with but slight hemorrhage. It was ovoid, and, when first measured, was three and a half inches long and two and a half inches in diameter. The base of the pedicle was nearly an inch in diameter. The patient is progressing toward complete recovery without a single unfavorable symptom. On the eighth day succeeding the operation she went down-stairs to dinner.

In reporting cases there is always a strong temptation to wander into a discussion of familiar theories and facts, this elaboration too often savoring of egotism. The recognition of this prevalent and objectionable propensity restrains me from offering any supererogatory comments regarding the nature and therapy of uterine neoplasms. There is, however, one feature connected with interstitial fibromata that I have failed to find mentioned in any text book, and this being prominently illustrated in the case before you, I desire to call attention to it more definitely. In all my post-mortem examinations of uteri containing interstitial myofibromata, I have been able to enucleate the growths quite readily, with the exception of one portion, which appeared to be intimately blended and continuous with the uterine tissues proper. Therefore I infer that, although the growth be completely embedded in the parenchymatous structures, it nevertheless possesses a distinct root. In the case just reported we observe that, after it was shelled out of the uterine wall, it became a polypoid

fibroma, its pedicle being large, dense and strong, offering no slight resistance to its *écrasement.*

Stated meeting, March 11th, 1884.

President Searle in the chair.

The first paper of the evening was read by *Dr. H. B. Millard,* on "Super-Alimentation, Artificial Alimentation, and the Employment of Alimentary Powders, according to the Method of Dr. Debove."

The system of treatment of numerous chronic diseases by the method indicated in the foregoing title, as introduced and practiced by Dr. Debove, of Paris, has become in the medical world, of that city at least, a subject of great interest. Except in France, however, no full exposition of it has been published, and such *excerpta* as have appeared have been so meagre as to give but a faint idea of its character.

In 1882, while I was in Paris, some of the medical friends of Dr. Debove gave me an account of the remarkable effects of his treatment, which seemed to me at the time a little exaggerated. I had made an appointment to visit the Bicêtre with him for the purpose of observing the practical working and results of his system, but was prevented from keeping it. I was more fortunate last summer, and passed considerable time with Dr. Debove at la Pitié, where he was then on duty, in examining patients treated by him by artificial and super-alimentation, taking notes of their histories, etc. I had then his own explanation of his method, the preparations of the powder used, etc., amplified by later interviews and correspondence; and, as I have since employed his system to a considerable extent, I look upon it as a duty to present to my medical brethren at home a brief exposition of what I consider a most valuable addition to the therapeutic art. Although since leaving Paris I have perused everything, I believe, likely to be of importance upon this subject, still, had not my own experience been favorable, I should perhaps not be inclined to write upon the subject.

The essential features of Dr. Debove's system may be mentioned as:

Artificial alimentations, by the œsophageal sound (*gavage*);

Super-alimentation, or alimentation by considerable doses of aliment, which, according to Debove, can be effected only by the sound; and

Lavage (washing or rinsing the stomach).

In papers read before the Société Médicale des Hôpitaux, in November, 1881, and April, 1882, upon the treatment of pulmonary phthisis by forced alimentation and upon the subject which constitutes the title of this paper, Dr. Debove presented his theories relative thereto, illustrating them by numerous cases of hospital patients who had been treated with benefit. Dr. Amanieux, of Paris, published in 1883 an elaborate thesis upon the direct administration of the powder of beef.* The "Bulletin général de thérapeutique" of May 30th, 1882, contains an interesting article by Dr. Dujardin-Beaumetz on the use of powdered beef, and Dr. Broca contributed to the "Progrès médical" in 1882 a series of articles upon *lavage* of the stomach; and the same year the thesis of Robin, on alimentary powders and artificial alimentation, was published. These by no means include all the literature of this subject, but they are among the most important publications.

The comprehension of the utility of artificial and super-alimentation involves the recognition of some commonplace facts—namely: that certain diseases destroy by inanition; that without the constant formation in a certain abundance of the products of assimilation to replace wasted elements and tissues, life cannot be sustained; and that in many ailments where life is waning there is often a duplex condition of inanition and disease of such a character as to make it difficult to discriminate whether it be inanition or the disease which is destroying the patient, and which it is that is keeping up the other.

"Inanition," says Chossat, "is the cause of death which marches abreast of and in silence with every malady in which alimentation is not in a normal state; it reaches its term sometimes sooner, sometimes later than the disease it accompanies, and

* "De la poudre de viande, son administration directe. Ses effets."

may become a principal disease where at first it had been only an epiphenomenon."

In pathological conditions, as well as in functional derangements, the appetite may undergo a variety of disturbances, from simple anorexia and nausea to vomiting upon the prehension of food. The two former, though comparatively unimportant when transient, become of grave importance when they persist and cannot be overcome.

"Anorexia is not," says Debove, "a *banal* phenomenon, but a deplorable complication which enfeebles the patient and delivers him, so to speak, without defense, to his malady. Often it is the cause of the disease, it has preceded it, prepared for it a favorable soil, and, the malady existing, it contributes to its maintenance. We often see hysterical subjects seized with disgust for all food, unable to take it in more than insignificant amount, despite the advice of the physician and their own efforts. I have already seen such patients die thus from inanition. Last year I was consulted by the family of a young girl, eighteen years of age, who had taken for several months, and that with difficulty, only a few grammes of nourishment daily. She was reduced almost to a skeleton, without any special lesion of any organ. This appeared to me a case where I should advise artificial alimentation; the parents, however, were frightened at the idea of introducing the sound, and my urgent representations could not change their ideas. The patient continued to refrain from food, and two months later, complaining of greater weakness than usual, with vertigo, was taken with syncope, and died without suffering."

Debove also treated last winter an hysterical woman whose symptoms were of a very serious character, especially spasm of the pharynx. For several months she scarcely ate, and her debility was extreme. It became necessary to introduce food by the sound, progressively increasing the dose. The patient improved visibly, and when at last she had gained sufficiently in weight, and her color had returned, the hysterical symptoms (not the *hysteria*) disappeared.

"Anorexia," says the same author, "is not a phenomenon special to hysterical subjects, it may be observed in a great number of patients; it prepares the ground for various diseases, and notably for tuberculosis. If it is not absolute, if the alimentation is simply insufficient, the physician is less struck by the relation of cause and effect; I know a number of tubercular cases having such an origin. These facts have not escaped authors, but they have interpreted them in a different manner, usually considering that the constitutional malady, still latent, has caused the anorexia; often, according to my own observations, the inverse pathogenesis is to be admitted.

"It is necessary, then, to watch with care the appetite of patients, to insist on their overcoming their disgust for food, and, should this be insurmountable, to resort to artificial alimentation. This method of treatment is applicable in cases of vomiting so frequent as to threaten the patient with inanition, or at least to alter profoundly the general health. Cases of vomiting called 'nervous' are often met with in the hysteric, in which the pathogenesis is very obscure; in consumptives vomiting often occurs, attributed (wrongly, in my opinion) to a mechanical cause, as the compression of the stomach by the diaphragm from paroxysms of cough; both these kinds of vomiting are usually amenable to artificial alimentation."

That the vomiting in phthisis after paroxysms of violent cough is not simply mechanical is shown by the fact that, after food has been artificially introduced into the stomach by the sound, violent spasms of coughing, sufficient to extricate large quantities of mucus, do not dislodge the food.

"Such is the series of arguments which led to the idea of forced alimentation. I admit them to be theoretical, but scientific results are seldom to be obtained, except by the aid of theories one is seeking to verify.

"Super-alimentation differs from artificial alimentation: by the former we propose to nourish the patient, and to prevent the disastrous results of anorexia, or vomiting; in the latter, to

introduce into the economy considerable quantities of food, and to increase organic combustion."

Anticipating somewhat at this point the description of aliments used by Dr. Debove, I would mention that the powder of the muscular fibre of beef is usually employed by him, being mixed with milk or hot water, so as to be of about the consistence of cream. Upon the excellence of the powder employed, and its proper preparation when administered, depends, most of all, the success of the treatment.

Other aliments than the powder of beef may be given by the sound, as eggs in beef tea, milk, etc.

Debove was led to the invention or preparation of powdered beef by the difficulty he experienced in making other articles of nutriment pass through the sound.

The two methods of administration consist in direct alimentation and forced alimentation, by the former method the food being given as any other food would be, with certain precautions and restrictions; by the latter, the food being introduced into the stomach by the œsophageal tube, or sound, this being employed when anorexia, nausea, or vomiting exists to such an extent that nourishment cannot otherwise be taken.

The class of ailments to which these methods are suitable are those characterized by emaciation from non-assimilation of food, chronic diarrhœas, nausea and vomiting, unless dependent on organic diseases of the stomach, and sometimes even then; the vomiting of pregnancy, chlorosis and anæmia, nervous maladies dependent on these, and in various conditions of exhaustion—as after acute illnesses, hæmorrhages, etc.—and, above all, phthisis pulmonalis. I have seen in Paris, and in my own practice at home, all these conditions relieved and cured.

Dr. Debove states that under the influence of super-alimentation—

1. Sweatings cease.
2. Cough and expectoration diminish and then disappear.
3. Patients gain in weight.

4. The strength returns.

5. Physical signs are modified; the signs due to pulmonary indurations or cavities subside, while those dependent on pulmonary secretions disappear. In cases of phthisis far advanced, with pulmonary lesions, the most that can be hoped for is that life may be prolonged. In acute and galloping consumption this treatment is useless. Fever is a contraindication, unless it come on in evening exacerbations.

Debove compares tuberculosis to plants that grow in a certain soil; the soil modified and enriched, other parasitic plants may grow, but they will be different from those that flourished when the soil was not enriched. Dr. Debove, it should be mentioned, is a firm believer in the bacillar origin of tuberculosis. (His lectures upon this at la Pitié, recently published,* are of great interest.) "I may say," says this author, "that by super-alimentation we give our patients strength to resist their malady; and our idea here may be rendered clear by this comparison: when the vine is attacked by the phylloxera, one of the best remedies is to manure the ground well. The parasite is not destroyed, but the plant is endowed with strength to support its harmful action. Super-alimentation is the inverse process of that by which a great number of subjects become tuberculous. It has been for a long time recognized that the cause of phthisis with many subjects is insufficient alimentation, and that this in its turn is of a character positive or relative, as poverty, excess of any kind, diabetes, lactation, etc."

Here, as I shall refer to cases in which artificial alimentation has been employed, I will describe the manner in which it is used. Dr. Debove employs for the introduction of the mixture into the stomach a soft elastic tube, about three-quarters of an inch in diameter, and having at the bottom two fenestræ; this part of the tube is twenty-two inches in length, and, although flexible, is of sufficient firmness to introduce easily; at the opposite extremity from that which enters the stomach there is

* "Leçons cliniques et thérapeutiques sur la tuberculose parasitaire," Paris, 1884.

a joint, and the tube after this is of a softer consistence, this part being thirty-nine inches long and terminating in a funnel-like expansion; into this end a large glass funnel is placed, into which the liquid is poured. This tube is a modification by Debove of Faucher's, who invented it in 1878. It may also be used for rinsing the stomach (*lavage*), the principles and methods of which will be given in another place. It can also be used as a stomach-pump, as it acts on the principle of the siphon, and is free from the danger of sucking in the mucous membrane, to which the ordinary stomach-pump is liable. I can not speak too highly of this beautifully contrived tube. It is easy of introduction, it can be used in cases of poisoning, and is the best long elastic tube I have seen for deep injections into the bowels.

The patient, sitting up or recumbent, throws back the head, the mouth wide open; the rounded extremity of the tube is placed behind the larynx and pushed down the œsophagus, the patient at the same moment being asked to make an effort to swallow; the sound introduced into the œsophagus, the joint will be, in an adult, in the mouth. This part of the operation is, the first two or three times, disagreeable enough, and may produce retching, threatening to displace the tube. It is necessary to await the subsidence of the nausea before introducing the alimentary mixture. To do this, the funnel is inserted into the extremity of the tube, a little above the head of the patient, if he is sitting up; if lying down, about a metre above the level of the bed; the mixture is then gently poured in. When this has completely entered the stomach the tube is slowly withdrawn. This part of the operation is sometimes, at the commencement of the treatment, accompanied by the rejection of a small quantity of the food; this accident does not occur after a few *séances*, when the sensitiveness of the pharynx is diminished. In withdrawing the sound, not only the funnel but the tube must be entirely empty, as otherwise a few drops of the mixture might enter the larynx. It is not necessary to lubricate the sound before its introduction; it is sufficient to wet it in any liquid, as

milk or water. After the third or fourth trial the patient is usually able to introduce the tube, swallowing it up to the joint —the mixture, of course, being poured in by another person.

As regards the danger of accidents from *gavage*, they should not occur; difficulties there sometimes will be. The size of the sound would make its entrance into the larynx by no means easy, still the possibility of this should be taken into consideration. The greatest difficulty usually experienced, aside from the existence of strictures by organic changes, is from spasmodic closure of the pharynx or œsophagus. In such a case force must not be used; the sound must be patiently withdrawn and its reintroduction attempted. Should the spasm persist, which does not often occur, however, the attempt should be deferred.

Debove recommends, after the funnel has been emptied, to pour briskly into it a small quantity of water or milk, to prevent adhesion of any of the food to the tube. Though the quantity be small, if it be lost several times daily it is of importance, when it is considered that the powder represents four times its weight in beef.

"The question is often asked," says Debove, "if the sound is indispensable, and if super-alimentation cannot be employed without it. It seems to me impossible to obtain super-alimentation, continued a sufficient length of time, if one simply forces the patient to *eat*; and precious time is thereby lost."

As I shall show hereafter, the powder can, I think, in most cases be administered *directly*, but not usually in such full doses as when it is given by the sound.

The first case in which Debove employed his method was that of a patient at the Bicêtre, with symptoms of advanced tuberculosis, with large cavities, profuse night sweats, great emaciation, and such weakness that he could sit up but a few hours. Whenever he attempted to eat he was seized with violent nausea, followed by vomiting and cough. The only food he could take was a glass of milk. "I introduced," says Debove, "by the sound, October 1st, a litre of milk, first

having washed out the stomach. It was perfectly tolerated, there being neither nausea nor diarrhœa. Afterward, encouraged by this experience, we increased the ration, using the sound twice a day, in these two times administering two litres of milk, two hundred grammes of finely minced raw beef, and ten eggs.

"Digestion was performed well, as there was no diarrhœa, and the perfectly clear liquid which ran out after each rinsing showed the stomach to be acting well. Another proof that the food was being digested and absorbed was that the patient increased in weight on an average ninety-two grammes a day.

"The treatment was followed by other effects no less remarkable; the profuse sweatings ceased; he had suffered from insomnia, and sleep returned and strength was restored to such an extent that our patient, who had remained all day in or near his bed, and who easily lost his breath, could now rapidly ascend two flights of steps of the infirmary, and walk outside a great part of each day. Expectoration was diminished, and physical signs improved; the cavities underwent no change, but the bronchial râles, diffused throughout the chest, diminished. The results in this case were too favorable for me not to employ the treatment in other cases.

"The second case was one of phthisis, in a much less advanced stage than the first. There were some crepitant râles at the apices of the lungs, especially the left; patient coughed much, had night sweats; no appetite, taking with difficulty a little broth. Forced alimentation, without *lavage*, was resorted to. In a few days it became possible to introduce by the sound, daily, in two doses, 200 grammes of beef, with ten eggs and two litres of milk. There were no untoward results. The average daily gain in weight for twenty days was 192 grammes; the sweats ceased, sleep and strength returned, and the patient could take a long walk without shortness of breath. Râles diminished. At the end of twenty-one days the daily average of urea excreted had increased from sixteen to thirty-four grammes.

"The condition of the third patient was still more unfavorable. He was in the last stage of pulmonary phthisis; there were large caverns in both lungs, tubercular laryngitis, and an uncontrollable diarrhœa, which had existed for several months. This patient was subjected to the same regimen as the others, except that bouillon was given instead of milk. There was, however, an average loss of weight of fifty grammes daily, though it may have been greater previously.

"In spite of the deplorable state of the patient, many important phenomena were modified: the sweating ceased, sleep returned, and the diarrhœa which had existed for months improved greatly, diarrhœic stools occurring only every three or four days.* Urea increased from sixteen to an average of twenty-seven grammes daily.

"One phenomenon especially was observed in each of the three patients. They experienced the sensation of hunger, complained when the sound was not introduced at the usual hour and this return of appetite led me to hope that the treatment might soon be suspended; the anorexia occurring most easily in patients who have sunk below a certain level, the general health improved, this tends to disappear."

The utility of artificial alimentation was discovered, as it were, accidentally by Debove. He first resorted to it in a case of phthisis with vomiting, because the patient could be nourished in no other way, and, upon augmenting progressively the dose of the food, was surprised to find nearly all the morbid phenomena improve in an unexpected manner.

The benefits resulting from the treatment are evident; they followed close upon it, the patients had been for a long time previously in the hospital under Dr. Debove, and they were not of that class of cases that, coming to a hospital, having been badly nourished, lodged and clothed, experience a steady improvement from hospital diet. Frequently, in autopsies after death from pulmonary phthisis, lesions so extensive as to be neces-

* It should be stated that a full dose of subnitrate of bismuth was added to the food.

sarily incurable are often met with. Nevertheless, the lesions cicatrized, and the caseous products eliminated, there may remain a sufficient respiratory surface. The important practical point is not the intensity of the affection at a certain point, but the extent of the lesion. Whatever the condition of the apices may be, if the two lower thirds of the lung respire sufficiently there are many chances of success.

Among other cases treated by Debove at the Bicêtre were the following:

Everard, who entered the infirmary in the service of Dr. Bourneville. Extreme weakness; profuse sweats; hæmoptysis; moist sounds at the apex of each lung; expectoration daily of 200 grammes of muco-purulent matter. To-day he does not cough nor expectorate; strength has returned, and he works the entire day. Auscultation at the summit of the lung gives only a dry sound, not easy to define. The precaution was taken of having this patient photographed before his treatment, so that his appearance before and after it might be compared. Gain in weight, ten kilogr.

Metzger, who had an attack of caseous pneumonia following acute pneumonia, in which resolution did not take place. In the two lower thirds of the right lung there was intense bronchial souffle; patient was feeble, and expectorated daily 140 grammes of purulent matter. Under the influence of super-alimentation, all the local and general phenomena disappeared, and sixteen kilogr. were gained in weight in two months. Is now quite well. This is not presented as a case of tuberculosis, but is, nevertheless, one of interest.

I saw at the hospital of la Pitié, in August last, with Dr. Debove, a number of cases of phthisis which had been benefited as much as those just presented. Their histories were given me by the *interne*, and I examined the lungs thoroughly and questioned the patient in each instance.

One was that of a man with cavities in the upper part of the left lung. There had been great emaciation, crepitant râles, sweats, cough, etc. At the time of my examination the moist

sounds had almost entirely disappeared, there was but little cough, and the patient was gaining flesh and strength.

Another was that of a girl about twenty-five years of age. There had been hæmoptysis, sweats, abundant mucous râles, and expectoration. These had nearly disappeared.

Among other cases than phthisis was one of chronic diarrhœa of long standing; under the treatment a cure was rapidly progressing. Another was a case of anorexia and vomiting, in an hysterical girl, who was being well nourished by the sound. I used the sound in this case myself, preceding it by *lavage.* Another, of vomiting, was the sequel of bilious fever. This patient also was nearly cured, and was taking, in addition to the powder of beef, one or two ordinary repasts daily.

After this outline of the character and effects of Dr. Debove's treatment, I will now describe more fully the character and preparation of the powder to be employed, its therapeutic and physiological effects, etc. Debove prepared it by selecting beef as free as possible from fat, separating it from the tendinous portions, and passing it through a chopping machine, making a coarse paste, which was then spread on plates and dried in stoves at a temperature of 90° centigrade (226 F.). The beef, hardened by drying, is triturated in a mortar, and then passed through a fine sieve. The powder thus prepared is impalpable, dry, and can be preserved indefinitely, if carefully kept from humidity, and is almost without odor. To make one pound of the powder, about six pounds of fresh beef are required, and one pound of the powder is equal to at least four of pure muscular fibre. Of this, as much as 400 or 600 grammes have been given by Debove daily, the latter quantity being equal to five pounds of beef. This is *literally* super-alimentation, and, unless provocative of some disturbance, could scarcely fail to bring about all the changes attendant upon thorough nutrition. Such large quantities as 600 grammes are, however, not often attained, and only, I believe, by the sound.

Simple as its preparation seems, practically, it does not appear so. I was shown at la Pitié numerous samples made by various

chemists; they were either strong-smelling, nauseous or unpleasant to the taste; some had putrefied, and showed under the microscope numerous living organisms; one, made from horse flesh, had a repulsive odor, but not more than one of the other preparations made from beef.

That the essentials of purity and freedom from disagreeable taste and odor are important, especially when the powders are used for direct alimentation, is evident when it is considered that they are usually administered where there is antipathy to food, with perhaps nausea and vomiting. Dr. Debove has used exclusively for a considerable time a preparation made by J. Ferré, a distinguished *pharmacien* of Paris; he considers it perfectly satisfactory, and even better than that made by himself, and I have seen no preparation equal to it. I have had a package in my possession for six months, and, although it has for two months laid open in my office, it has undergone no deterioration. I have used in my own practice about 150 boxes, each box containing eight ounces, most of which was imported at my request by E. Fougera & Co. A possible objection to its general use is the price at which it must be sold. The retail price in Paris being five francs, it has to be sold here at retail for about $1.50. It must be considered, however, that eight ounces of the powder are equivalent to about two pounds and a half of the fillet of beef, which would not be retailed for less than fifty cents a pound. M. Ferré has recently prepared costly machinery for making it on a large scale, and the price may possibly be reduced. There are several *poudres de viande* made by reputable chemists in Paris, and advertised in the French medical journals, and I am unable to say that some of them may not be as good as the *poudre de viande de Favrot* (Ferré being Favrot's successor), but at least I have seen none as good.

There is no doubt, however, should the method of superalimentation by the powder of beef become greatly employed, that some of our manufacturing chemists at home will succeed in making an equally good powder, and, the price not being

enhanced by high duties, etc., that it can be sold here as cheap as in Paris.

The prominent advantages of this powder over other substances used in super-alimentation are, first, as regards beef, raw or partially cooked, finely chopped up; this is usually repulsive to the taste, and is liable to produce tænia. Second, as regards the employment of beef juice; this is an aliment very weak in nutritive principles, and is the least nourishing portion of the beef, containing only the mineral salts, a few soluble organic constituents of the beef, and some nitrogenized compounds. The powder, on the contrary, contains all the nutritive elements. Third, the digestibility of the beef is increased by each particle being so minute as to be brought in contact with the gastric mucous membrane, and a greater secretion of gastric juice results. Again, a difficulty is experienced in giving, in certain diseases, a large quantity of food, on account of its bulk. But of this powder there can be given by the sound, with two or three quarts of milk, as much as 600 grammes, with six to ten eggs, daily. Another and great advantage is the facility with which adulterations can be detected. To test it, it is necessary only to examine the powder under the microscope with an objective of 250 to 400, when the muscular fibres, more or less torn or broken, with their longitudinal and transverse striæ, are easily recognized. Should foreign substances, as the powder of liver, lentils, starch, rice, etc., have been added, they are easily recognized. Finally, its agreeable character and the facility, under proper restrictions, with which it can be taken for a continued length of time, and its great nutritive value, which will be shown as I proceed.

I have not been adverse to the employment of other nutritive powders, but, however great their merits, I have found none suitable for artificial and super-alimentation but the *poudre de viande.* Reed, Carnrick & Co. prepare a powder of casein, beef and gluten, and though it is carefully prepared, and though I have given it with the same precautions as Ferré's *poudre,* I have not found it in many cases easy of digestion. Among

other alimentary powders may be mentioned the powder of milk, the powder of lentils (cooked), the powder of beef and lentils combined, and the Revalenta Arabica, which is composed largely of cooked lentils. Dr. Guerder, of Paris, has introduced, and recommends as superior to the beef powder, the powder of defibrinated beef's blood. Dr. Guerder's theories, mode of preparation, etc., may be found in the *Therapeutic Gazette*, November, 1883, and February, 1884.

The powder of liver has been employed in the French hospitals, but its odor and flavor are objectionable.

By dessication of beef, according to Debove's method, it should lose none of its nutritive properties, but only its liquid principles, and these possess but slight nutritive value. According to the analysis of Berzelius, the flesh of beef contains seventy-seven per cent. of water, consequently a gramme of the powder would equal about four grammes of fresh beef.

As regards the digestibility, compared with that of finely minced raw beef, Dr. Robin* made extensive experiments as to the artificial digestion of these two, and found that the powder was digested three times as rapidly as the chopped beef. This is confirmed by Debove.

Broca ("Progrès médical," Oct. 14th, 1882) says that he has shown by experiments that it is digested five times as rapidly as ordinary beef. The fine particles which compose it absolve the weak stomach, as it were, from the necessity of grinding it, its extreme divisibility facilitates the impregnation of the smallest particles by the gastric juice, and peptonization is more easily accomplished.

As to the assimilation of the powder and its furnishing the organism with nutritive principles: that both these are accomplished is shown by certain cases in which records were kept, mostly at the Bicêtre; the cases of Everard and Metzger, already given, show a great increase of weight. Numerous other cases

* See Robin, "Des poudres alimentaires et de l'alimentation artificielle," Paris, 1882.

also show this, and a notable increase in the amount of the urea excreted.

Among the cases showing an increase of urea are the following:

André (Bicêtre). Treated by Dr. Debove; had had profuse hæmoptyses, daily expectoration of 35 grammes of purulent matter; it was impossible for him to sit up an hour; now neither coughs nor raises; sleeps well; has no more sweats, and works all day. The coarse râles at apices of lungs have been replaced by dry sounds. Gain in daily amount of urea excreted at the end of ten days, 10 grammes.

Same service. A tailor. *Tuberculosis. Super-alimentation by Gavage.*—Average quantity of powder of beef for thirty-four days, about 300 grammes. The patient also took milk, and, as soon as the appetite had returned, any other food he wished. Gained in weight in thirty-four days, 3 kilogr. Urea increased from 35 to 73 grammes daily.

Simple Anorexia (Bicêtre).—Marie W., aged four years; imperfectly developed; weight 12 kilogr.; complete loss of appetite, taking food only by force. Direct administration of the powder with rum, about 10 grammes being given daily; an increase of nutrition being brought about, an appetite for other food returned. Powder administered daily, however, except at the end of two months, when it seemed to produce flatulence. At the end of ten weeks she had gained 4 kilogr., and her appetite had returned.

Chronic Diarrhœa (Bicêtre).—Marie, coachman, aged sixty-six. Diarrhœa had existed for eighteen months. Treatment commenced November 22d, 1882. There were great debility, sweats, painful digestion, and intolerance of food. Weight, 44 kilogr. Fifteen grammes of the powder three times daily; quantity increased gradually to 90 grammes a day; no other food except a little milk at first, and afterward soup. From December 17th he took an ordinary meal daily, in addition to the powder. By November 27th the stools had gained in consistence and the sweats disappeared. December 5th the strength had greatly increased,

the appetite returned little by little, and by the 17th of December he was able to take two meals daily with the other patients. Only one evacuation daily. Powder always given, but only once a day now. January 23d, 1883, he was dismissed cured, having gained in weight 11 kilogr. *No medicines were given.*

Chronic Ulceration of Stomach, followed by Tuberculosis.—Carjat, aged fifty-four. Cavern in apex of left lung. Hæmatemesis, sweats, and cough. Treated by direct alimentation; sound not used. Three litres of milk, six eggs, and 180 grammes powder of beef used at first. In fifteen days the quantity of the powder was increased to 300 grammes. By this time the weight had increased one and one-fourth kilogr. Six weeks later he had gained two and one-half kilogr. more, and the ulcer and phthisis seemed cured.

The details of the treatment of this case, pathological conditions, etc., are of much more interest than the mere increase of weight, and, inasmuch as recoveries from diseases of a character to produce emaciation are invariably followed by increase of weight, it will not be necessary for me to present other cases illustrative of this.

The cases, however, show in a general way what may be derived from the powder when no other food can be tolerated. There may be instances in which it seems applicable where it would prove useless, but I believe that in the majority of instances in which it is appropriate it will, if properly administered, be beneficial.

Dr. Amanieux, *loco citato*, endeavors to show that the powder can always be given without the sound. That it can often be done I know from experience; but to insure the ingestion of large quantities, to *super-nourish* (*suralimenter*) the patient, the sound must in some cases be used. As the simplest method, however, the direct administration may at first be tried. The digestibility of the powder and the ability of the patient to tolerate it depend greatly upon the manner in which it is prepared.

The simplest excipient which can be used is evidently water. If this be employed, it should be dropped, hot or cold, upon the powder, and stirred or pressed with the spoon so as to make a homogeneous paste; the water can then be added little by little until the mixture is of the consistence of cream. If these precautions be not taken, the mixture contains numerous fine lumps, more difficult of digestion and distasteful to the patient. Powdered sugar may then be added to suit the taste, and the mixture flavored with a little rum, cognac, essence of punch, or vanilla. I have found Angostura bitters with sherry very acceptable. The mixture resulting from its preparation with milk is smoother, but, as Debove says, "there are patients who cannot get down three or four times daily a bowl of cream." For such patients water may be used, a greater amount of smoothness resulting from mixing the powder first into a compact mass with the yolk of an egg. A teaspoonful or two of black coffee gives a pleasant flavor, and for children an equal part of cocoa can be added.

Patients sometimes complain that it leaves a glutinous feeling in the pharynx; in such cases a little light red wine may be swallowed. It is better to make the mixture so it can be taken in two or three swallows. All these are apparently trifling precautions (*petits soins*). It is necessary, nevertheless, to observe them.

Its use may be commenced in moderate doses, as, for instance, 10 to 25 grammes in the morning; it then serves very well the place of breakfast. Other food, however, as tea or coffee, may, if the patient wish, be taken an hour or two after it. Should the patient be unable to digest other food, as much as 300 grammes of the powder (equal to 38 oz. of beef-fibre) can often be taken daily. It sometimes, however, at first produces diarrhœa, and often, where it has been taken for several days, the stomach seems to become intolerant of it and not to digest it readily. In such cases I diminish the doses, or intermit its use for a day or so; and, where it can not be otherwise taken, I resort, if the patient's consent can be ob-

tained—which is not always possible in private practice—to the sound. With proper care, however, I have given the powder in full doses by direct administration for several weeks consecutively. Nevertheless, there are cases where this is impossible, as we all know how the stomach tires of a uniform regimen; and then the tube becomes necessary.

I cannot here enumerate more than a few of the most striking cases treated in the French hospitals, nor present more than a digest of them. Some of them, however, I will give, selecting those as varied in their character as possible, and add my own experience. In addition to the cases already presented may be cited the following:

Hysterical Spasm of the Pharynx. (Hôpital St. Antoine, service of Dr. Dujardin-Beaumetz.)—Angèle L., aged fifteen. Admitted August 8th, 1882. Anorexia to such an extent that in March, 1882, no solid food could be taken, and for the last fifteen days has been unable to retain liquid food. Upon examining the patient, she was found to be greatly emaciated; there were rhachialgia, mastodynia, *clou hystérique* of the head, and cutaneous anæsthesia of both sides. When she attempted to swallow pure water it was rejected by a spasm of the pharynx. The tube was resorted to, and, to the surprise of Dr. Beaumetz, entered without difficulty. The stomach being washed, 20 grammes of the powder were introduced in a little milk; no vomiting. By the 11th of August, there were administered daily 300 grammes of the powder and a litre of milk, but it was not until the 16th that she could take *directly* a little milk without vomiting; she then took a cupful. (On the 14th she had the first natural movement of the bowels.) On the 24th artificial alimentation was discontinued, 150 grammes of raw beef, with two eggs, being taken. September 9th she was dismissed cured.

Locomotor Ataxia, with Vomiting. Direct Alimentation. (Bicêtre, service of Dr. Debove.)—Lepraire, aged forty-one, confined to his bed. Admitted December 27th. For several weeks severe cramps in the stomach, anorexia, and frequent vomiting of food.

Seventy-five grammes of the powder were given by direct administration in one day, and well digested. To January 23d this amount has been taken daily without the least repugnance or derangement of the digestive tract. No other nourishment except a little milk, wine and soup; patient has experienced, from the first day of treatment, none of the gastric pains. Strength has returned in a very appreciable degree.

Tuberculosis, with Diarrhœa and Vomiting. Super-alimentation by the Tube. (Hôpital St. Antoine, service of Dr. Beaumetz.)—B., a polisher, aged twenty-seven. Admitted July 4th. For nearly a year there have been cough, night sweats and emaciation. For several days there have been diarrhœa and vomiting, with the paroxysms of cough. No appetite; moist sounds at the summit of left lung; at apex of right lung a cavity; generally diffused bronchial râles. Weight, 56 kilogr. July 6th, 100 grammes of the powder administered by the tube, with half a litre of milk; no vomiting. July 9th, a litre of milk and 200 grammes of powder given. 13th, vomiting and sweats absent. Weight, 57 kilogr. From the 19th, 300 grammes of powder, with a litre and a half of milk, daily, were given by the sound, without any inconvenience to the patient. By July 30th, in addition to the powder he took two good meals daily; has resumed work. August 5th, he weighed 59 kilogr.; obliged to stop work; cough always troublesome, but much less than at first.

Tuberculosis. Direct Alimentation. (Bicêtre, service of Dr. Debove.)—Rochet, aged thirty-two. Admitted November 19th, 1882. Had been ill for two years. Has had evening fever, night sweats, hæmoptyses, and colliquative diarrhœas. These symptoms all existed on admission; there were great debility, bloody expectoration, inability to sit up and extreme repugnance to and intolerance of food. Weight, 48 kilogr. Although the minutest details of treatment are given, I will only say here that by January 23d, he was able to take 200 grammes of the powder daily, together with other food, was able to work in the laboratory, respiration was better and cough almost gone;

sweats disappeared, and but little expectoration. Weight, 58.4 kilogr., a gain of 10 kilogr. in about ten weeks. The powder was given, diluted with sweetened water and with a little rum. The patient was not reported as cured.

As to the employment of *lavage* in organic diseases of the stomach, there might be, in certain cases, danger of breaking down newly formed cicatricial tissue or delicate vascular walls, and producing hæmorrhage; but, undoubtedly, lavage can ordinarily be employed with advantage in contributing to the nourishment of the system in cancer or ulceration of the stomach. Although a cure be impossible, life may be prolonged and suffering assuaged. Broca ("Progrès méd.," October 7th, 1882), giving the opinions and experience of Dr. Beaumetz, Germain Sée, Kussmaul, and others, shows that *lavage* with artificial alimentation may be ordinarily resorted to in cancer and ulcer of the stomach, whether the cancer be ulcerated or not. This method is sometimes the only one of detecting the presence or absence of organic disease. Cornillon ("Progrès méd.," November 17th, 1883) gives an account of a case of hæmatemesis from ulceration in an alcoholic person where the hæmorrhage was brought back by throwing in a quart and a half of water, this occurring each time it was used. Care and judgment, however, must be used; lavage cannot be employed indiscriminately in all cases, and the amount of liquid thrown in must vary.

Among the cases of *ulcer of the stomach*, in addition to those reported by Kussmaul, Bucquoy, and others, is that of Carjat, already referred to in showing the effect of super-alimentation. (Hôpital Bicêtre, service of Dr. Debove.) This patient, a man aged fifty-four, suffered from a simple ulcer of the stomach. He had had five or six severe attacks of hæmatemesis, in the intervals between which there was occasional vomiting of glairy mucus, with intense epigastric pains. In January, 1881, he was in a condition of marasmus, and seemed at the point of death. In six weeks, *lavage*, followed by alimentation by the tube, had brought about an entire cure of the gastric trouble, and he had gained 3.5 kilogr. The middle of March he left the infirmary,

still feeble, however; he continued to practice lavage at his own home, which he did easily twice a day; was able to work; there were occasional pains, but no vomiting. At the end of a few weeks he discontinued lavage, using it only when there was great heaviness in the epigastrium. The year after leaving the infirmary the patient became tuberculous, the ulceration returned, and artificial alimentation was employed by Debove, with the results before given. This case shows that neither lavage nor superalimentation is contra-indicated in simple ulcer during the period of cicatrization, there having been no hæmorrhages for a considerable time. Large quantities of food, however, introduced when hæmorrhages are liable to occur, might produce serious accidents.

In *alcoholic gastritis*, Dr. Beaumetz considers *lavage* sovereign ("Bull. gén. de thérap.," October 13th, 1880). Dr. Constantin Paul has given a case, and Broca (*loc. cit.*) gives the following case at the Bicêtre, where the cure was prompt and complete:

Hamerlin, aged thirty-seven, admitted March 30th, 1882. Scrofulous constitution. Has been an inordinate drinker. For fourteen months violent gastric pains after eating; nothing but milk tolerated, and frequently not that; vomiting of acid substances, and constant pituitous catarrh. Vomiting finally became incessant, and, when admitted, digestion seemed quite given out. April 5th, Dr. Debove resorted to *lavage*. Tepid water used, and Vichy afterward; the exit from the stomach followed of a considerable quantity of the detritus of food hardly attacked by the gastric juice, and having a bad odor. A demilitre of milk introduced; this was well supported. April 6th, lavage and Vichy, followed by the introduction by the sound of fifty grammes of beef powder. During the day he drank two litres of milk. These brought on the pain in the evening; lavage resorted to and undigested liquid withdrawn. Half a litre of milk introduced by the sound; patient felt well for an hour, when pain set in, and at 5 A. M. there was an attack of intense pain followed by vomiting. In view of this persistence of gastric pain following the lavage as ordinarily employed, Dr. Debove changed the treatment. Instead of two

lavages, each followed by a repast, *lavage* and the sound were resorted to only mornings, a litre of milk and one hundred grammes of powder being given, and the stomach was emptied when the pains commenced. This modification was followed by excellent effects. *Lavage*, after pain, brought away foul undigested aliment. By April 28th he was given daily three litres of milk and three hundred grammes of the powder. May 29th, discharged cured. For full details of these two last cases, see "Progrès méd.," September 30th, October 7th, 14th, and 21st, 1882, where a fuller explanation of the theory and practice of lavage may be found.

In many cases in which the stomach does not digest, it is because it is embarrassed by irritating substances, the detritus of former repasts, which, accumulating and decomposing, interfere with the secretion of the gastric juice. In time, the changes and degenerations become permanent, and a cure is impossible; but, if these irritating substances be washed out, and certain aliments introduced, digestion becomes possible. Dr. Debove's method is usually to throw in a litre of simple water, followed by a litre of artificial Vichy. The tube of Faucher, modified by Debove, as heretofore described, is used, this acting as a siphon, and being free from many objections of the stomach-pump.

Since October 1st, 1883, I have employed *poudre de viande*, both by direct alimentation and by the tube, in a considerable number of cases, in the majority of instances with great benefit, and I herewith present some of the most striking.

Vomiting of Pregnancy.—Mrs. W., primipara, aged twenty-two, two and a half months pregnant; general health excellent. October 15th, had had for more than a month severe retching daily; impossible to retain any nourishment except a little dry bread or broiled ham, which produce acidity. These cases of uncontrollable anorexia and vomiting in pregnancy are too common to make it necessary to dilate upon the symptoms of this one. It is sufficient to say that none of the ordinary measures of treatment were of use, and it became evident that the patient would

sink unless she could in some way be nourished, or premature labor be induced.

Injections of sanguis exsiccat. were used, also of Reed & Carnrick's peptones, but both had the effect of producing severe tormina. Tongue dry, and dry retching and vomiting of greenish mucus; great prostration; kidneys perfectly healthy.

November 15th, I obtained her consent to introduce Debove's tube, which I succeeded, fortunately, in doing without much difficulty. Ten grammes of the powder, prepared with the yolk of an egg and water, introduced; retained. Some crampy pains in the stomach. In the evening the same quantity, with a teacupful of milk and a little brandy to counteract the debility, was digested. The next morning, November 16th, there was less retching, and at 8 A. M., twenty grammes with half a pint of milk given; retained; at 1 P. M., the same quantity; at 8 P. M., twenty grammes with half a pint of milk. November 17th, 8 A. M., twenty grammes with milk; retained; 12 M., twenty-five grammes given. Is obliged always to keep her bed, movement being followed by nausea and retching. A small piece of beef digested. Eight P. M., twenty-five grammes of the powder. This was followed by vomiting and two or three loose movements. November 18th, 8 A. M., no nausea. Twenty-five grammes with milk; rejected. At 11 A. M., took a mutton chop, and at 5 P. M., some rare beef and bread. November 19th, as the stomach was most sensitive mornings, and as she was now stronger, I deferred the use of the tube to 11.30 A. M. Thirty-seven grammes, however, introduced; retained. At 6 P. M., took soup and beef. November 20th, at 12 M., fifty grammes with milk and a little cognac; digested; took a very good dinner. Every day, until November 30th, the same plan was pursued. By this time the stomach had gained so much strength, and the gastric juice seemed to be so well secreted, that I determined to try to dispense with artificial alimentation. The next morning, at eleven, she was able to take a chop, and from this time the artificial alimentation was discontinued. I do not think it necessary to give here more than the outlines of the case; and would only

state further that by the 20th of December she was able to take sufficient of ordinary food to maintain her strength and to go about the room. She is now, March 1st, quite free from nausea.

This is the only case in which I have known artificial alimentation by the sound employed in the vomiting of pregnancy. Whether it be likely to prove useful, generally, in these cases, remains yet to be seen. I cannot, however, tell why it should not be, where the vomiting is idiopathic and not dependent on any disease of the kidneys or uterus, and I hope the experience of others will prove as favorable as my own, though I cannot suppose it will in all cases.

ANOREXIA AND NAUSEA FROM MALARIAL POISONING.—J. S., a woman, aged thirty-three, fifteen years ago had bilious fever, and was salivated to such an extent as to cause all her teeth to fall out. Previously, her constitution and health were unusually robust; since then they have never been perfectly normal. A transatlantic trip in the summer will keep her well until the next summer; but, without it, every winter and spring are characterized, particularly on the occurrence of warm, wet weather, by great physical depression, neuralgic headaches, fainting turns, nausea and loss of flesh. In December, 1883, was confined to her bed for several weeks with these symptoms: anorexia, dry retching and inability to contain any nourishment. Twenty-five grammes of the powder given with milk and a little whiskey, and retained; the evening of the same day the dose was repeated. Next morning, thirty-seven grammes; well digested. This was given three times daily, and she soon became able to take other food; great improvement in strength. The attempt to increase the quantity to fifty grammes three times a day was followed by a violent fit of vomiting, and it became necessary to omit it for a day. It was then resumed in doses of thirty-seven grammes three times daily. Its use has been since continued regularly, about thirty-seven grammes being taken twice a day with other food, and the result has been a considerable increase of strength.

After the patient had commenced sitting up, a compound powder of another maker, which was highly vaunted, was administered; but it produced violent vomiting and purging. I do not give the name of the maker, as I do not wish to seem to disparage other fabrications.

I have observed equal benefit from the treatment in several other cases of anorexia, nausea, vomiting and loss of strength, the result of malarial poisoning.

PHTHISIS PULMONALIS, DIRECT ALIMENTATION.—C. M., aged thirty-eight. Several members of this patient's family died of consumption. His own lungs became affected three years ago. I first saw him February 14th, 1884. He had been confined to his bed for three weeks. Right lung dull at apex; left lung, principal lobe full of cavities; lower, infiltrated; numerous smaller cavities; profuse purulent expectoration; extreme debility; aphonia; evening temperature, average about 100.5°; morning, normal. I determined to employ the powder here, because I thought it would give him more strength. Dr. Charles McDowell undertook to superintend its administration, and it was given as follows:

		POWDERED BEEF.
February	16	75 grammes.
"	17	100 "
"	18	150 "
"	19	175 "
"	20	175 "
"	21	137.5 "
"	22	162.5 "
"	23	137.5 "
"	25, died at 5.30 A. M.	

For several days there was quite an increase of strength, and the powder was taken without difficulty, and even relished.

PHTHISIS PULMONALIS, DIRECT ALIMENTATION.—R., aged thirty-two. Softening and râles all over left lung anteriorly; bronchial respiration; evening exacerbations of fever; night sweats; weight, 120 pounds; appetite and digestion good; naturally very healthy. Commenced giving powder in twenty-five-gramme

doses before breakfast, and a similar quantity in the night; as he required nourishment then; well digested. The next morning and night gave thirty-seven and afterwards fifty grammes. The morning dose was in time increased to seventy-five, and the evening to fifty. After the seventy-five grammes in the morning he felt no desire for other food till lunch. Three-fourths of a pint of milk and two or three eggs were given with the dose of powder. The one hundred and twenty-five grammes were equal to about sixteen ounces of beef, without fat or fibre. After two months of this treatment the weight was 132 pounds; the cough, sweats and fever all diminished; the moist sounds have almost disappeared. Is in a fair way to recover, and has just started for the South to avoid the bad weather of March.

There were two favorable conditions for the improvement in this case—namely, the circumstance that there was no inherited disposition to consumption, the family being an exceptionally healthy one; and the fact that the patient was able to take this food in large quantities, together with other food, without inconvenience. Three or four teaspoonfuls of rum were added to each portion of the powder.

PHTHISIS PULMONALIS, DIRECT ALIMENTATION.—A young lady, aged nineteen. The mother died of consumption; has had since last spring a dry cough, with dyspnœa; pains in the chest; respiration of right side harsh and prolonged; bronchophony and slight dullness of percussion; menses absent for three months; emaciated. December 1st, commenced the administration of the powder. It has been well borne, and seventy-five to one hundred grammes daily have been taken with other food. March 1st, there had been considerable gain of strength, together with two pounds in weight. Menses come on every six weeks, though scanty; cough and pains are better. Other remedies, however, have been employed in addition to the powder.

PHTHISIS PULMONALIS.—A. R., a man in advanced stage of phthisis. Night sweats, vomicæ, infiltration of both lungs, abund-

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ant expectoration, anorexia and nausea. The patient has been greatly benefited by the powder, and has been able to take two hundred grammes daily with milk and whiskey, the benefit consisting mostly in improvement in strength and diminished cough, sweating and expectoration.

PHTHISIS PULMONALIS, ALIMENTATION BY THE TUBE.—A lady, aged forty-five. Diffused râles over both lungs; dullness of percussion in left lung anteriorly and posteriorly, and over right lung posteriorly; sweats; violent cough and muco-purulent expectoration; great emaciation; intolerance of food; nausea and vomiting; great difficulty in retaining anything on the stomach. Had the powder prepared in various ways, but she could not take it, each attempt producing nausea or vomiting. I represented to her the advantages of super-alimentation by the tube, and she at last consented to permit me to use it. The first time, January 1st, I introduced twenty-five grammes, with milk, which was retained. The next day the same amount twice. Four hundred grammes are now given daily, and the patient is gaining in weight. All her symptoms and physical conditions are better. She takes considerable other food, and her strength is increasing. The sound is introduced without difficulty by her nurse.

PHTHISIS PULMONALIS.—Mrs. B., aged fifty; parents consumptive, and cases of scrofula and cancer in the family. Pulmonary affection began in March, 1882. Admitted to the hospital December 6th, 1883. Has profuse night sweats; evening temperature averages 101; dyspnœa; cough, with profuse muco-purulent expectoration; dullness marked in upper part of right lung with bronchophony; moist râles all over right lung; softening; moist râles in upper portion of left lung; is very weak; weight, January 6th, 1884, eighty pounds. Commenced the use of the powder, giving it in milk with a little brandy. In thirty-eight days she took, on an average, thirty-eight grammes per diem, equal to five and a half ounces of beef. This was perfectly assimilated. The patient paid for a private room in the hospital, and could not be compelled to take the powder in as full doses as

might have been tolerated—on some of the thirty-eight days not taking it at all. Once or twice it produced vomiting. I represented to her the benefit to be derived from *gavage*, and she consented to have it employed; but she found the introduction of the tube so unpleasant that I was obliged to desist. The principal objection she made to the powder was that it produced, all over, a sensation of intense heat, followed by sweating. This is a phenomenon generally to be expected, but after a time the sweating diminishes. In spite of the moderate amount of powder taken, a great deal of benefit was obtained. The cough, sweating and expectoration diminished, the breathing became freer, and, on examining the chest, February 29th, I found almost complete absence of moist sounds. Her weight increased, while taking the powder, from eighty to eighty-one and a half pounds —not a large amount in itself, but important considering that her inherited tendencies were of the worst, that she was in an advanced stage of phthisis and was rapidly failing, and that she took only moderate quantities of the powder.

Dr. James W. Ward, the house physician of the hospital, notes down the following points of improvement which he observed:

"1. Improvement of general strength.

"2. Increase of weight.

"3. Lungs have been less painful.

"4. The sputa, which previously sank in water, now float.

"5. The bowels, which were constipated, have become regular.

"6. Appetite for other food, which was sadly depraved, has increased. Temperature has been lower since the use of the powder was commenced. In short, nutrition has been improved, and she has advanced in many ways."

I believe that, were I permitted to employ artificial alimentation in this case, I should bring about a very great amount of improvement in every way.

The intolerance to the powder, which is liable to occur after it has been taken for a few days, has already been mentioned; this may usually be overcome. The physician, however, must not pronounce against it, if it be at first repugnant to the patient

or produce nausea or diarrhœa; his ingenuity in making it acceptable must be employed, the time of taking it, the dose, and the quantity of other food carefully regulated. In cases of organic disease of the stomach it has been found that it can be tolerated for a longer time and with less inconvenience than other articles of food. Not only is its digestibility marked in the stomach, but also in the intestines. The conclusions of Amanieux (*loc. cit.*) are:

1. That the direct administration of the powder never produces immediate revulsion of the digestive tube (vomiting or diarrhœa) *if the dose be not too large*, except where there is fever or some affection in its acute stage. This conclusion applies equally to direct and artificial alimentation.

2. That the stomach tolerates very well the powder of beef in suitable doses, according to the manner of administration, even if this organ be subject to functional disturbances or there be anorexia.

3. That it is well borne by the stomach under the same conditions; and

4 and 5. That the entire digestive tube tolerates it, even when it can bear no other food; and this is the only aliment that can be borne by subjects in the most advanced stage of tuberculous and cancerous cachexia. My own experience has shown me, however, that an occasional case will be met with where its direct administration will not be well borne in sufficient doses to be of benefit. These are, however, rare.

According to the same author, the following phenomena are observed: Sensations of *bien-être*, slight elevation of the temperature, increase of sweating and perspiration, increase of appetite, digestion of food generally, phenomena of organic reparation, followed by diminution of sweats and expectoration. That these phenomena are observed as a rule is shown by this author from hospital records. A well-recognized fact by medical men, and formulated by Béclard,* helps explain the return of the appetite,

* "Traité élémentaire de physiologie."

namely, "the removing of the need of food (appetite) is in relation to the activity or rapidity of the nutritive movement."

According to Debove, however, artificial alimentation shows that there is no relation between the appetite of patients and their digestive faculties. A patient, for instance, who loathes all food, will digest a large quantity readily when introduced by the sound. In other cases vomiting would occur, the patient suffering from actual hunger, masticating and swallowing with pleasure. In these cases, food introduced artificially would be retained.

Finally, it is not expected that the *poudre de viande* will prove a panacea; it will fail sometimes when skillfully used, directly, or by the sound, even where it seems in every way appropriate to the case.

While I do not advocate it as a perfect means of cure in cases where assimilation is mainly at fault, neither do I expect to see it relegated to the limbo of vaunted remedies and therapeutic agents which have been tried and found wanting. It has been used too thoroughly in crucial cases, by physicians deservedly eminent, to be any longer an assumed and theoretical system of treatment; and I have employed it myself with so much care and success as to feel assured that from it many cures are to be expected in cases where no room seems to exist but for discouragement and despair.

The second paper was read by *Dr. Wm. Tod Helmuth*, on "Two Rare Cases of Exstrophy of the Bladder."

CASE I.—*Complete exstrophy, epispadias, one ureter. Entire absence of right kidney, the left one measuring nineteen inches in its great circumference.*

CASE II.—*Complete exstrophy, epispadias, enormous inguinal herniæ, and retained testicle on the right side.*

Complete absence of the urinary bladder. is very rarely met with, and if such were the case, the ureters would probably be found opening somewhere on the surface of the body—perhaps around the umbilicus, or into the rectum or vulva.

Cases have also been known of what is termed double-bladder, in the which a septum more or less perfect has been found,

stretching between the walls of the viscus and dividing it into two cavities.

The variety of malformation which is most frequently seen, but which is also of rare occurrence, is that known as exstrophia, or inversion of the bladder. It appears to me that the term "inversion of the bladder" does not convey to the mind a proper idea of that arrest of development which we are about to consider. When we say inversion of any hollow body, we do not necessarily understand that its *structure is deficient*, but merely that it has been turned inside out or upside down; whereas, in the cases that I have seen, and the descriptions of all those I have read, there has always been a complete *deficiency in the anterior* wall of the bladder and abdominal wall.

In the majority of cases, the arrest of development appears to be first in the abdominal walls, then in the symphysis pubis, and finally in the structures beneath.

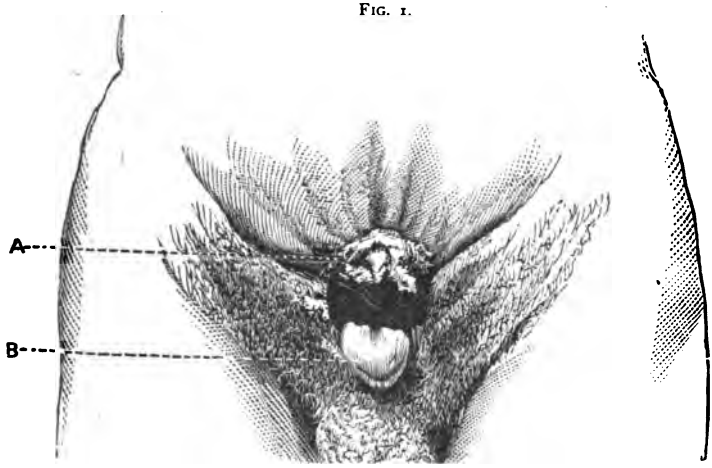
In the female, the deformity is often accompanied by an absence of the clitoris, and in the male, by a fissure of the urethra, or "line epispadias." In the hypogastric region we find protruding the posterior wall of the bladder, fiery red, with here and there a rudimentary trace of the mucous coat, of a bluish color. The circumference of the organ is lost in the surrounding integument, which has the appearance of a cicatrix, and is also bluish. The orifices of the ureters are found in the lower half of the organ.

The malformation is said to occur much more frequently in males than in females; and the late Mr. Earle, of London, states that, after a careful examination, he has found sixty-eight cases upon record, of which sixty were males. Others have given the ratio as four to one. In twenty cases by Mr. John Wood, but two cases were found in females. Agnew has collected fifty-three cases, of which but eight were females. I have had under my own care five cases of this deformity, and operated upon two; of these, four were males, the last a female.

My first case occurred to me in St. Louis, in August, 1870. The patient was twenty-four years of age, and well developed;

was over five feet in height, and enjoyed moderately good health. There was a wide separation of the pubic bones (about two inches), an entire absence of the umbilicus, and the red and fiery mucous membrane of the *trigonum vesicæ* protruded through the abdominal deficiency (see Fig. 1, A). On the left side of the bladder a slight nodule marked the opening of the ureter, into which a No. 6 bougie (English) could readily be passed. The penis was a little over an inch and a half in length, and was completely epispadiac (*vide* Fig. 1, B), the urethra being split entirely open, somewhat like a trough. By raising the bladder and depressing the urethra, the veru montanum, and

FIG. 1.



the openings of the ejaculatory ducts, were distinctly visible. There was also a rudimentary prostrate. The testicles were of good size and apparently perfect; the scrotum was large and full, and, as the integument extended from the bag to the groins on either side, it became so voluminous that it could readily be grasped and held by the hand. This is well represented in the cut.

Several methods of operating were considered and rejected, until finally the following one was performed on August 20th, 1870, at twelve M., in the presence of Drs. Franklin, Nibelung, Tirrell, Morrell, Goodman, Gundelach, Campbell, Garrett, Read,

and a number of others. The lateral flaps were made of the redundant groin tissue, and drawn over the protruded viscus. The edges of these flaps were fastened in the median line, and the nodular mucous circumference was also pared. The tissue was so loose that the flaps were adjusted without any stretching. A semi-lunar flap was then dissected up from the abdomen above the bladder, turned down, and slid under the lateral flaps and there secured. The operation lasted an hour and a quarter, and there was very smart hæmorrhage from both superficial epigastrics, which were cut.

The patient came out of the ether well, but passed a bad night, the urine constantly trickling from beside the small catheter, which had been inserted into the ureter. There was also a great deal of vomiting, which *Ipecac* controlled, and some hæmorrhage from left groin, which was arrested by Monsel's styptic. The wound below—in other words, where the urine constantly dribbled—did not heal; the upper portion, however, united, but on August 25th (five days after the operation, the weather being also intensely hot), a profuse diarrhœa set in, which was kept in check by *Phosph. acid.* On August 28th he was somewhat better, but the orifice of the ureter became clogged with blood, and upon removing the obstruction nearly a pint of urine was discharged. The quantity impressed me beyond measure, as at that time I could not form an adequate idea of the location of the receptacle which could contain so much fluid.

At this period a severe cough with mucous râles appeared, and the nervous system of the patient suffered materially, and on September 1st he gradually sank and died without pain. The emaciation was so rapid and complete that his friends scarcely could recognize him. On carefully examining the wound, I found the flaps had partially united in the upper part of the median line, the lower portion of the wound was open, and the orifice of the ureter clogged up with calcareous matter. A very careful examination of the body was made by Dr. J. S. Read, the professor of anatomy in the St. Louis College of Homœopathic Physicians and Surgeons, and which, with a more

precise description of the case, can be found in the *Western Homœopathic Observer* for September, 1870. The most important and anomalous condition found at the necropsy was the entire absence of the right kidney and the enormous size of the left, which Dr. Read thus describes: "Lying in the left hypochondriac region, and extending down into the left lumbar region, in immediate contact with the abdominal walls, was found the left kidney, filling the left lumbar region so completely as to leave no space for the descending colon and small intestines. The peritoneum was greatly thickened, not only in the renal region, but throughout the whole extent. The renal capsule was quite small—about one-half the normal size—and of very loose texture. Tearing the kidney away from its attachments, it was measured. In the great circumference it measured NINETEEN AND THREE-FOURTHS INCHES; around the lower part, TWELVE AND THREE-FOURTHS INCHES; near upper end, NINE AND THREE-FOURTHS INCHES. The ureter was twelve inches long, slightly saculated; towards the lower end, just as it was about to enter the vesical substance, it was greatly reduced in size; the walls of the ureter varied in thickness from one line to three lines, the thickest portion being above. This thickening extended to the pelvis of the kidney, which appeared as if it had been enlarged, the appearance being wholly due to the increase in the thickness of its walls. The pelvis of the kidney and the ureter were both filled with calcareous matter, about the consistency of thin mortar, the mucous membrane being finely dotted with minute calcareous particles, that were with difficulty rubbed off. The kidney of the right side was entirely absent, not a vestige was there, nothing even rudimentary.

"The ascending colon was in its proper position, but did not extend high enough; the descending colon commenced on the right side of the spine, crossed it, dipping down underneath the small intestines to join with the rectum; the ascending and descending portions were united by the transverse colon, about three inches in length, these parts forming a small arch towards

the right side of the body. The mesenteric glands were enlarged; many of the small glands presented a grayish appearance. The vas deferens was the usual size; the spermatic cord was normal in every respect. When, however, the vas deferens reached the internal abdominal ring, it turned abruptly, forming a very acute angle, then proceeded in a straight line for the seminal vesicle, which was rudimentary. The vesical portion of the abdominal wall was three-fourths of an inch thick, composed principally of fibrous tissue. The interval between the bones at the pubic symphysis was filled in with a dense fibro-cartilaginous growth, interspersed with cellular spaces or cavities lined with fine vascular membrane. The cremaster muscle was more fully developed than I have ever seen it, its fibres being continuous with those of the internal oblique, forming a thin, flat muscular covering for the cord, before it began to break into loops, which were also fully developed and very distinct."

Dr. Gross states the disease is almost irremediable, and there can be no doubt whatever that, all things considered, there is but a poor prospect for ultimate recovery. There has been a successful operation reported by Mr. Simon, of London, who caused the ureters to open into the rectum, which was performed by introducing threads from the ureters and carrying them to the rectum, and there allowing them to remain until the passage was complete. The patient, however, most narrowly escaped with his life. Mr. Loyd's case, in which the communication was effected by a suture, died on the third day. Mr. Sidney Jones, of St. Thomas' Hospital, also attempted a similar operation, his patient perishing of fatal peritonitis, as did also the cases of Mr. Johnston and Mr. Loyd.

Mr. Holmes endeavored, also, to establish a communication between the bladder and rectum by clamping up that portion of the exstroverted bladder between the ureters until sloughing and ulceration of the tissues were effected.

Dr. Levis, of Philadelphia, conceived the idea of making a fistulous opening between the bladder and the perineum, first by the passage of setons, and afterwards by drawing a small bougie in the track of the silk; this was effected. A second operation

for the purpose of covering the bladder wall by turning the scrotum upward and covering in the penis and fixing it under a small abdominal flap was attempted; the patient, however, died on the twelfth day.

The idea of covering up the bladder by plastic operations, that is, of taking the integument from the surrounding structure, is much more satisfactory, and has been done a number of times. It was, I believe, first suggested by Roux and Richards in 1853, and has been performed by Dr. Pancoast, of the Jefferson College, Philadelphia, in 1853, and by Dr. Ayres, of Brooklyn. The latter was more successful than the former. Afterwards Holmes and Wood, of London, performed somewhat similar operations, the latter having practiced it seventeen times.

Dr. Ashhurst, of Philadelphia, has made three operations, two of which were successful. Bryant, also, has been successful in covering the sensitive bladder wall by taking the flaps from the groin and the scrotum.

Maury's operation is a modification of that of Roux. He makes a large convex flap from the groin, perineum, and scrotum, cuts a small hole therein for the passage of the penis, turns this flap upward with the cutaneous side inward. A short flap is then raised of integument on the upper and lateral portions of the exstrophy, and the first flap slid under it and secured.

The results of these autoplastic operations are far more encouraging than those performed for diverting the course of the ureters or the establishment of fistulous openings. Dr. Ashhurst has analyzed fifty-five cases, of which forty-three recovered, four failed and eight died.

The case which I have just presented has some important peculiarities :—

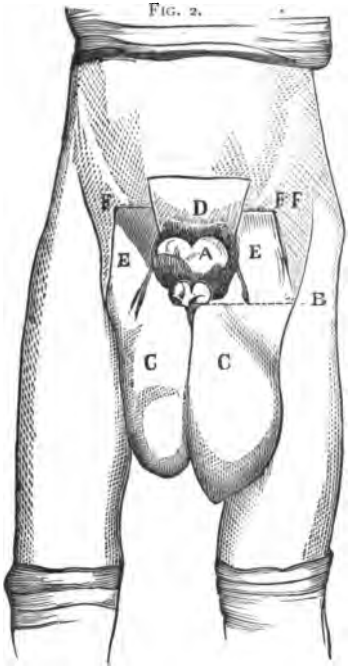
First.—Entire absence of one ureter;

Second.—Entire absence of one kidney, and the enormous size of its ureter and renal pelvis; and,

Third.—In the wide and slit-like openings of the seminal ducts.

CASE II. The second case is also quite as remarkable as that one already mentioned, being peculiar in the fact that the parents supposed their child to be a girl, and dressed "it" in that fashion, which variety of habiliment is at present adhered to.

FIG. 2.



The patient is about sixteen years of age, of light complexion and auburn hair, having that peculiar expression of distress that belongs to those suffering long. I must call her "she," for I have attended upon the case so long, and have always seen the patient attired in petticoats and frocks, and never observed anything bearing any resemblance to the male but a twisted and deformed epispadiac rudimentary penis. The umbilicus is entirely absent. The pubic bones are widely separated. The scrotum, when in the erect position, is very large, and immense inguinal herniæ are seen on either side. (C, C, Fig. 2.) The *odor urinæ* is almost intolerable, and the sensitiveness of the red and exstroverted bladder (A, Fig. 2) is only equaled by that exhibited in the rudimentary glans. The urethra is split entirely open to the base of the bladder, and is about an inch and a half long. The penis (B, Fig. 2) has two corpora cavernosa, and is capable of erection. I may state here a fact unknown to me before the first operation, which is, that with the arrest of development of other parts, I found entire deficiency of the recti, nothing but a moderately thick fascia, which became thinner and thinner as it approached the exstroverted bladder, covered the intestines. The patient was weak and miserable, very irritable,

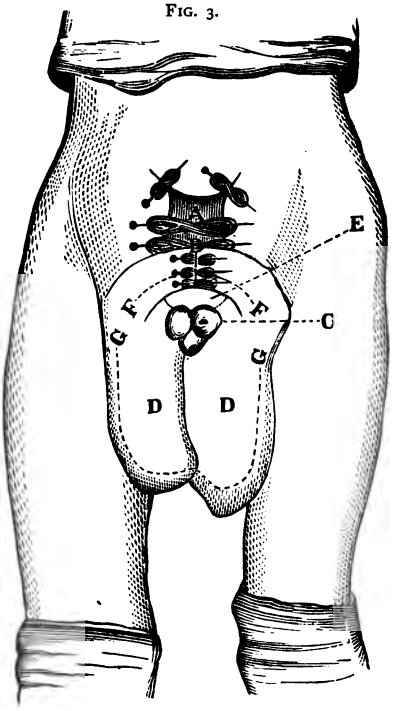
with a pulse always at 120 to 130, and a temperature about 101°.

To relieve this deformity, I performed two operations, the first one somewhat similar to that I devised for the case already recorded and which is almost identical with that known as Wood's, which has recently been practiced by Ashhurst, of Philadelphia, with success. It is said that Prof. Wood, of King's College, London, has had seventeen cases of exstrophy of the bladder, most of which have been benefited by the operation. On Dec. 10th, 1883, in the presence of a portion of the class, and Dr. Minor, Dr. Bacon, Dr. Berghaus, Dr. Wilcox, Dr. Rice, Dr. Danforth, Dr. J. H. Thompson, Dr. L. Safford Gillespie, Dr. Cordelia Williams, Dr. Fanny Kellogg, and many others, I began the operation by measuring the flaps and marking them out on the abdominal wall. The first flap was taken from above the bladder, and was of sufficient size to cover that exstroverted viscus as with a lid (Fig. 2, D), the cutaneous surface being approximated with the mucous coat of the bladder. It was in making this dissection that, unaware of the absence of muscular tissue beneath, I made an incision into the fascia, and a small portion of peritoneum protruded. This opening was at once brought together with carbolized gut. The side flaps were then made with their base to the scrotum (Fig. 2, E, E), to be nourished by the superficial external pudics and superficial epigastrics, and twisted over upon themselves, and united in the median line with hare-lip pins and figure-of-eight suture; by this means the angles F and F F in Fig. 2 were brought to B, as seen in Fig. 3; the angles of the raw surfaces were then approximated and the patient placed in a semi-recumbent position in bed. The wounds were dressed with calendula.

Fig. 3 represents the appearance after the first operation: A the raw surface left by superior flap, B the point of union of the lateral flaps secured with hare-lip pins, C the rudimentary penis, D D the scrotum. This first operation was successful thus far, viz., in the complete union of the flaps in the median line; but the contraction of the cicatrix above had a tendency to draw up

the flaps so that the exstroverted bladder was but half covered (E, Fig. 3). This operation, however, was productive of much good, inasmuch as the child could bear the weight of the dressings and bedclothes upon the flap, which was almost impossible before. A great change also was noted in the disposition; from being irritable, morose, and indeed sometimes almost savage, she became so placid and cheerful that the change was noticed by every one who was in attendance upon her. Before the flap wounds had entirely healed, her condition was so much improved that I concluded to try a second and more extended operation, utilizing the pendulous scrotum for flaps, castrating the patient, and, if possible, curing the herniæ. To that effect, therefore, on Jan. 19th, 1884, I removed a strip of the integument from the lower border of the new flap about three-quarters of an inch in width (see dotted line F F in Fig. 3). I then reduced the hernia on the left side, and about two-thirds of the gut on the right, finding it impossible on that side to restore the whole tumor. Beginning then close to the body on the left side, I split the entire scrotum up to the body, making the incision on the right side from G to G, and having pared a strip on the tegumental side (*vide* the shaded space between the dotted line and the margin of the scrotum), in order that the raw surface would come in contact with the denuded edge of the new flap (dotted line F F) made by the previous operation, I turned the anterior half of the scro-

FIG. 3.



tum upwards, and fastened it with pins and sutures to the lower margin of the flap above, covering in entirely the rudimentary penis and leaving the raw surface of this scrotal flap (denuded of the tunica vaginalis) exposed. I then drew down the left testicle and cut it off, having ligitated the cord with catgut, proposing to do the same with the right stone, but it could not be found, on account of the hernia on that side being only partially reducible. I, however, returned as much as I could of it into the abdominal cavity.

The next step was to make the side flaps, which I took from each groin and united to the median line over that portion of the bladder which could be seen. I then brought the posterior half of the scrotum upward and fixed it to the remaining exposed surface of the already turned-up anterior wall.

These wounds all healed kindly but very slowly, having had to skin-graft several of the raw surfaces. Although I made an incision in the anterior scrotal wall as it was turned up, and drew the penis through it, the organ was so unmanageable that it slipped away from the opening. Knowing that Levis, of Philadelphia, had, in his operations, turned the penis in with the anterior scrotal flap, this did not give me much uneasiness; but I found afterwards that I should have amputated the penis, because the titillation of the skin caused erections of the organ, which, pressing upward upon the newly forming connective tissue, gradually separated a portion of the bands of adhesion and allowed a portion of the lower flap to fall downward.

I consider the operation a success. I have had a urinal made, which enables the patient to go about with comfort. Before these operations she was in constant pain, the pressure of the clothes upon the sensitive bladder causing great suffering, and frequent bleeding took place from the mucous surfaces. Now she can wear her clothes comfortably, and I think life certainly will be rendered at least endurable.

It will be seen that both these cases were of the male sex. The third case which I now have under care is a female. There is only a rudimentary vulva, no clitoris, no pubic bones, and, I

judge, no uterus. Of this latter, however, I am not positive.

The speaker exhibited photographs representing the first case cited before and after operation, and illustrated the operation performed in the second case by a series of colored drawings.

The President then delivered the subjoined address in presenting the Pendleton Prize to Dr. Millard :

At the last meeting of this society the report of the committee to which was entrusted the consideration of essays for the Pendleton Prize was received and adopted.

That report recommended the award of the prize to Dr. H. B. Millard for his recently published work upon Bright's Disease.

In completing this transaction, permit me to indulge in a few remarks.

I think I do not err in saying that Dr. Millard's monograph is the first work which has ever emanated from our branch of the profession containing and based upon important original pathological investigations.

In stating this, I do not deny that here and there in our literature there are evidences that others have made original researches, and thereby extended pathological knowledge ; but our honored colleague, so far as I know, has been the first to enter the laboratory, and with scalpel, microscope and pencil produce results which outreach and outshine those of the boasted pathological school in one of their chosen fields.

If I am not in error as to this fact, it is one which deserves commemoration at our hands, as marking a new departure in our ranks, and, as I think, a significant one.

I would not intimate that I feel at all ashamed of the labors of the homœopathic school, nor of their published results. We have done a great and enduring and useful work—work more needed and more practically and immediately useful to humanity, than mere pathological research.

But our efforts, for the most part, have been limited to the fields of Materia Medica and Therapeutics. There was pressing need of such work. It was and is the legitimate and proper outcome of the genius of Homœopathy, and during half a

century we have been absorbed in developing a Materia Medica, and its applications, which have so greatly added to the resources of the physician, as to enable him often to outstrip the therapeutics based upon the pathological study of ages.

In my view, the true and crowning glory of Hahnemann and his followers is and will ever be, not the law of cure upheld by him and us, but the enunciation and demonstration of the truth, that the only method of laying an enduring and reliable basis for all therapeusis of any and every name, is by testing the effects of drugs upon the healthy.

To have established this dogma and compelled its adoption—to have elaborated its results in a materia medica, inadequate and imperfect as it is, is an achievement of which we may well be proud.

I refrain from anything like a full discussion of these topics as entirely out of place at this hour. But I cannot resist noting this departure by Dr. Millard from our traditional work.

I congratulate both him and ourselves that this first foray into the pathologic field has been one which has commanded the admiration and praise of the medical world without regard to therapeutic theories.

I congratulate this society also upon the publication of this work, for I believe that its existence is in a measure due to the animus which founded this organization, and which has verified and sustained its five years of life.

If such are to be some of the fruits of our labor, we builded better than we knew when we established the Medico-Chirurgical Society. Our little tree, planted with hope, and cultivated with some self-sacrifice, has budded and blossomed and borne fruit already. May it still grow and thrive and bring forth an abundant harvest.

There now remains for me, as your executive officer, the highly pleasing duty of publicly presenting to our honored colleague this beautiful and valuable medal—"Perge O Puer, sic itur ad astra."

Dr. Millard, in responding, said that he instinctively shrank from any such public demonstration as had just taken place, and was willing to have it occur only in support of the dignity which belonged to the Society. He expressed his thorough appreciation of the kindly and complimentary sentiments formulated by the honored President, and sincerely hoped that they were not wholly prompted by feelings of personal friendship. His interest in the welfare and reputation of the Society had been largely instrumental in assisting him in his investigations, and he trusted that the work accomplished might at some time prove of lasting benefit, not only to suffering humanity, but also to the Fellows of the Medico-Chirurgical and the profession at large.

Stated meeting, April 8th, 1884.

President Searle in the Chair.

A resolution was offered by the Secretary, and passed by the Fellows, to the effect that hereafter the records of the Society shall incorporate the titles of the papers read, the discussions of said papers, and such other business as may come before the Society for action.

That hereafter the papers as read shall appear in full in the published Transactions, and not in abstract as heretofore.

The first paper of the evening was read by *Dr. Hallock,* on "A Case of Diphtheria."

About the 12th day of February last, Miss E. D., of this city, aged twenty-five years, after standing some minutes in the rain waiting for her carriage, returned home slightly fatigued, with dress and skirts wet, which she neglected to change for dry ones nearly an hour. The following night was restless, but unattended by chill, fever or soreness of the throat, and in the morning complained of weariness and great prostration, increased by the slightest movement almost to faintness. The skin cool, pulse normal, appetite and thirst wanting.

This condition of extreme weakness, suggesting the exhaustion of active hæmorrhage, or of profuse choleræic discharges, con-

tinued for three days, attended only by slight nausea and gastric distress after swallowing the least drink or nourishment.

Then followed slight fever with increasing gastric disturbance, the pulse and temperature rising each afternoon, but the heat at no time reaching 103 degrees. To these symptoms, after four or five days, were added severe strangury and pain in urinating, requiring the use of the catheter for relief. The urine was normal in quantity and gave no trace of albumen or sugar, the thirst increased and the evening aggravation of fever was attended by headache and mild delirium.

Up to this period, about the tenth day of the disease, the case was diagnosed as *gastric fever* of a remittent type, by myself and two fellow physicians who saw it but once only. The following morning the patient complained for the first time of slight pain in the throat, hardly felt except during the act of deglutition. Examination showed both tonsils and the palate covered with large cream-colored diphtheritic deposit, for which phytolacca, arsenic, cyanide of merc., etc., with inhalations of water, brandy, etc., were tried in vain for three days, when the patient, though continuing to swallow with little suffering, died from exhaustion.

The history of this case, thus briefly given, suggests the important inquiry, was the disease an idiopathic diphtheria from the first, or only a secondary development and effect of the preceding gastric disorder and fever? In favor of the former opinion may be adduced the sudden and extreme prostration of the attack, resembling the exhaustion of collapse, continuing till the third day without reaction, and then succeeded by slow and moderate returns of normal temperature and pulse, such sudden depression of the vital powers indicating the effect of some specific poison rather than the invasion of a mild form of fever. To this may be added the severe strangury which followed, showing such a degree of urinary irritation as often attends severe forms of diphtheria. These symptoms, preceding the culmination of the disease into its last and fatal form, induce the belief that its invasion as well as termination was due to

the effect of diphtheritic poison. On the contrary, may not the early prostration and subsequent gastric derangement and fever, have been but the natural effect of fatigue and exposure on a cold and rainy day, resulting after nearly two weeks' sickness in the development of true diphtheria?

Does the history of this disease, as seen in actual practice, or as stated by reliable authors, sanction the opinion that the poison of this formidable disorder may sometimes, like scarlatina and other eruptive fevers, observe a period of incubation and general constitutional depression, before its full and characteristic development?

In the discussion that ensued, *Dr. Fowler* remarked, that at one time he had been under the impression that a patient, under proper conditions, might suffer from two distinct forms of diphtheria—one contagious, the other non-contagious. He now thinks that true diphtheria is *always* contagious; that the disease, subsequent to infection, is essentially constitutional, and that the local lesions attending it are simply local manifestations of the constitutional condition. At one time he made an autopsy which revealed implication of a large portion of the descending colon by the diphtheritic membrane.

Dr. Leal had witnessed a number of cases of diphtheria in which an intercurrent attack of some other disease had very materially delayed the development of the diphtheria.

The second paper, by *Dr. Minor*, on "The Medical Faculty Bills," was informal in its character, consisting of extracts from the three bills before the profession, with comments relating thereto. There was no discussion.

Dr. Minor also exhibited a specimen of mammary carcinoma, which he had recently removed from one of his patients. The different steps of the operation were minutely described, as were also the old methods of operating, as compared with those of more recent date.

Dr. Leal presented the following note on "Excision of the Uvula by the Persian Barbers." Translated from the French of M. Tholozan (Bull. Acad. Méd., Jan., 1884, p. 8).

In the districts of Semnan and Firouz-Kouh, in Persia, excision of the uvula is practiced by the barbers on almost all the infants, as a means of prophylaxis against inflammations of the throat.

Two instruments are required for the operation—a strong wooden spatula, and a steel chisel, of which the sharp extremity is curved on the flat, or sometimes even forms a complete ring of 7-8 millimetres in diameter.

The barber rapidly introduces the spatula into the mouth and lays the anterior surface against the posterior surface of the uvula. He then applies the cutting instrument to the concavity formed in the anterior face of the uvula by the pressure from behind forward. The uvula is thus completely severed by pressure combined with lateral movements, and the small piece excised is removed by the two instruments in juxtaposition. The barbers in the two localities mentioned perform this operation with great dexterity, and for the moderate sum of a few centimes.

Tholozan was not able to see the operation performed, but examined a large number of persons in whom the uvula had been either totally or two-thirds removed. This custom is very ancient in the districts which he visited, no one knowing the precise time of its origin, and Tholozan places the date back at least five or six generations.

Parents have the uvula of their infants amputated sometimes as soon as the first month, and even as soon as the first day after birth ; more often at the age of one, two or three years. They pretend that the cutting, by enlarging the isthmus of the pharynx, lessens the danger of suffocation in the different diseases of the throat. They think likewise that these diseases are rendered less frequent and less severe.

Tholozan says : " I have interrogated several barbers who have practiced this operation a great number of times. They see no danger in it, and have assured me that they have never had an accident of any sort. Inhabitants of the country who have submitted in their childhood to the amputation, have declared also that they have never heard of accidents. It is to

be supposed that the inconveniences of this operation, if any exist, must be very rare, otherwise the custom would not have been perpetuated until to-day."

It is not without interest to remark that the custom exists in no other locality of Persia, and that it remains confined to the two small towns of Semnan and Firouz-Kouh and in the villages which surround them, where inflammatory and catarrhal diseases of the throat are very frequent.

Stated meeting, May 13th, 1884.

President Searle in the chair.

The first paper of the evening was read by *Dr. Wm. M. Butler*, on "Abscess of the Cerebellum, with Specimen."

From the infrequent occurrence of abscess of the cerebellum, we have inferred that a short study of this subject might be of interest and profit to this society.

In a collection of seventy-six cases of abscess of the brain made by Sir Wm. W. Gull and Henry G. Sutton, and recorded in Reynolds' "Practice of Medicine," we find thirteen involving the cerebellum. In six, collections of pus were found in the cerebrum as well as the cerebellum; in the remainder the abscesses were limited to the cerebellum. Of these, seven were located in the right lobe of the cerebellum, four in the left lobe, and in two the location is not mentioned. As to the sex of the patients, eight were males, five females. The ages ranged from seven years to fifty-six years. In all, pain in the head was a prominent symptom, in three being limited to the occiput. Seven had discharges from the ear upon the side on which the abscess was located. Convulsions occurred in two and loss of co-ordination in two. Five were paralyzed upon the right side of the body. Of the causes assigned, eight were attributed to disease of the ear or some portion of the temporal bone, two to diseased lungs, one to a fall, one to abscess near the uterus, and one to chronic abscess in sheath of left rectus abdominis muscle.

Our attention has been especially directed to this subject, from having been called in consultation several months since by our friend, Dr. J. Lester Keep, of Brooklyn, in a case of this kind, when I diagnosticated disease of the cerebellum, and a few weeks since had the satisfaction of seeing my diagnosis corroborated by a *post-mortem*—the specimen we take pleasure in showing to the Society this evening.

For the history of the case we are indebted to the father of the child, a most intelligent and well known scientific gentleman, who has most carefully studied the disease from its outset, through whose kindness also I am able to present this interesting pathological specimen.

The history, substantially in the language of the father, is as follows:

Birth.—June 22d, 1880. Oldest son; second child. Weight at birth, ten and a half pounds. No instruments used. Head good size, considerably distorted. At the superior angle of occipital bone, a little to the right of the median line, was a bunch three-fourths of an inch in lateral diameter, three-eighths of an inch in vertical diameter, and three-eighths of an inch in projection. This bunch was fast to the skull; was like a growth of cartilage, and seemed like a development of the occipital membrane.

Pre-natal Influence.—Mother watched daily beside her father during the last seven weeks of his life. During this time her father had an enlargement of the prostate gland; a surgical operation on the same, and died from blood poisoning. The boy resembled, in a striking manner, his grandfather in disposition, intellectual traits, complexion, eyes, general features and shape of head. His mother felt, from the first, that the sickness of her father would have a marked influence on the child.

Hereditary Influences.—Grandmother, on father's side, suffered during childhood and early womanhood with so-called erysipelas of the face and head. Heart disease has removed about one-fourth of relatives on father's side at an advanced age. Otherwise relatives on father's side remarkably free from disease and living to great age.

Mother had ulcers, during her childhood, in the ears and throat. Mother's brother had fistula in rectum at age of nineteen. Otherwise relatives on mother's side free from disease and of average health and vigor. No taint in either blood of father or mother.

History.—First period, from birth to March 1st, 1882 (one year and eight months). Nursed by mother sixteen months. As a baby, was large, perfectly formed, very healthy, with large hands and limbs, full chest and well shaped head. He was considerably more attractive, intelligent, and beautiful in countenance and disposition than average children from parents of similar station in life. In September (at fifteen months) the penis became much inflamed. Dr. Keep prescribed for erysipelas, and the inflammation soon disappeared. First two teeth came at four months. First upper teeth at eight months. First sixteen teeth came without sickness or much pain. Was several times troubled with constipation. Otherwise than mentioned was a healthy and comfortable baby.

Second period, from March 1st, 1882, to September 18th, 1882 (twentieth to twenty-seventh month).

About March 1st, boy rubbed a piece of skin from back of his head, near the bunch, which had grown a trifle from the first. The scab formed and was rubbed off. This was repeated several times. There was little or no inflammation, but scab was continually forming and had to be removed daily. Great care was taken to protect, cleanse and heal the sore, though only water, castile soap and vaseline were used. On July 12th, no progress having been made, the vaseline and washing were discontinued for four days. July 15th, the boy was sick and restless. At night the sore broke and discharged. July 16th, it was examined by Dr. George B. Twitchell, of Keene, N. H., who thought the sore no cause for anxiety, but a scalp sore such as frequently accompanied teething. He prescribed a wash (ingredients unknown) and a return to the former treatment, with vaseline ointment and soap. July 18th, a small swelling, resembling a boil, appeared between the scab and the original bunch. This grew rapidly, and on July 24th, a large abscess, inflaming the scalp over the entire

back of the head, was lanced by Dr. C. S. Holden, of Boston. The abscess discharged profusely at first, grew gradually smaller under the influence of flax-seed poultice and later vaseline, until on August 12th, a healthy scab had formed, and the opening and the original sore had disappeared. August 12th the boy fell from a piazza down two or three feet, striking in some way the back of his head, barely breaking open the upper part of the scab. No other effects of the fall were noticeable. The boy continued to improve until September 18th, the sore occasionally discharging a trifle. The sloughing of the sore removed the bunch. During this second period the digestive system was occasionally disturbed. The symptoms were slight constipation, some distress apparently of the stomach, and paleness about the mouth. Accompanying these symptoms were heaviness of the eyes, fretfulness, lassitude, and probably headache, some fever and slight chills. These attacks returned with some regularity. They were attributed to effects of teething.

Third period, September 18th, 1882, to February 20th, 1883 (twenty-seventh to thirty-second month).

Boy was taken sick, was uneasy and fretful, complained of sickness, suffered a good deal of pain in stomach, was inclined to lie down all the time. His countenance was sallow, and his general appearance such that his father observed "that the sore upon his head had struck in and made him sick." On his return to Brooklyn, on September 25th, Dr. J. Lester Keep was called and managed the case until January 1st, making about twenty-five visits in the time. He found, in September, the digestion impaired, bowels constipated, stomach weak and a general sluggishness of the functions of the body. One of the double teeth was about breaking through. The boy improved under his treatment. About October 20th, one morning a strabismus of the eyes appeared. About the same time a slight paralysis of the muscles of the face. November 10th, while taking an injection, the boy fainted and for several days was not as well. From September 25th to December 1st there was a partial paralysis of the muscles of the lower extremities. After December 1st, or thereabouts,

Winchester's Hypophosphites were given with surprising improvement. At Christmas-time was threatened with pneumonia, but by January 1st was running about the house. From January 1st to February 20th he ran and walked in a tolerably vigorous manner, but his run was a waddle, showing want of power or of co-ordination of the muscles of the legs. During the autumn months he would frequently, while sitting, throw his head back and hold it in a most unnatural position. He had, however, in February no trace of his former illness, save his peculiar run and the sore on his head, which was in a nearly quiescent condition.

Fourth period, February 20th, 1883, to October 1st, 1884.

On February 20th came down with whooping cough, and had it very severely. The straining brought on again some of the old symptoms of weakness, diminished control of the muscles of legs, slight crossing of the eyes, sickness of stomach and general lassitude. By March 15th he had rallied to nearly his condition before February 20th. From March 15th until June 20th he was running about the house, on the sidewalks and in the park, but was not strong nor was his run natural. About once in two weeks he would have sick turns, lasting from two to five days. These periods were accompanied by stomach pains, whiteness about the mouth, constipation, heaviness of eyes, lassitude, profuse head sweats, and some feverishness. The fæces on one or two occasions were quite light colored. The sore on the back of the head was practically healed by March 15th. On June 20th one of his usual sicknesses came on, though more severely than usual. He declined rapidly until July 11th, when he was not expected to live. During his decline there seemed to be almost complete muscular paralysis. Power to move his legs was gone. His hands, particularly his right hand, were paralyzed. The muscles of his throat, tongue, face and eyes were affected so that it was with difficulty he swallowed, spoke or closed his mouth. The paralysis was more on the right side than on the left. From July 11th he improved a trifle almost every day until October 1st. In recovering power to move his limbs his first motions showed almost no power of

co-ordination. About August 1st he was not as well one day, and during the day a large sack, filled with watery fluid, blood and a very little pus, formed on the back of the head, over the interparietal suture. The swelling was one and three-fourths inches up and down, five-eighths of an inch high and seven-eighths of an inch wide. When this sack was opened the boy was relieved, and improved more rapidly than before. From September 15th to October 10th he looked to be in perfect health, ran in the fields and there was no sore upon his head.

Fifth period, October, 1883, to April 4th, 1884.

During the first part of October the boy walked a little too far on two or three occasions, and may have caught cold, and somewhat rapidly lost strength. October 16th I was called in consultation with Dr. J. Lester Keep, and saw the patient for the first time. I again visited him with Dr. Keep on October 19th. These were the only occasions on which I saw him before his death. At this time there was slight strabismus, with dilatation of the pupils, and a peculiar troubled, anxious expression. He was quite fretful, complained of pain in his head and feeling sick. Although weak he showed no paralysis, was able to walk, but with a peculiar staggering gait, indicating marked lack of co-ordination in the muscles of the lower extremities. His mind seemed clear, bright and precociously developed. From the previous history, and my own personal examination, I diagnosticated the case one of disease of the cerebellum, the paucity of the symptoms then present rendering it impossible to positively state whether of the nature of an abscess or a tumor. From the 20th to the 30th of October the boy showed in a milder form all the symptoms of his previous illness. From October 30th to November 5th he was in a very precarious condition. During this attack a new feature appeared. On October 5th he complained of itching of the feet. The itching was followed (as early as the 10th inst.) by hard red bunches or blotches on his feet. These bunches extended gradually over his limbs and a few appeared upon his back. They finally turned dark colored, formed small blisters, turned black and disappeared. None of these

blotches appeared after November 5th. From November 5th to November 29th the boy improved very rapidly, grew strong, fleshy and tall, and was able to walk about the room. From November 30th to December 16th he caught two slight colds, which only seemed to hasten another decline. By December 20th he was very low indeed, and the end seemed near. In the efforts made one stormy day to keep the air about him fresh he caught a very violent cold and was threatened with bronchitis. This cold was broken up with the exception of a cough, which lasted until January 15th, 1884. January 8th complained of pain in the ears, and January 12th the left ear discharged pus profusely. The right ear began to discharge two or three days later. January 18th a swelling appeared on the left side of the neck, which increased until about January 28th, when it was lanced and discharged a large quantity of green and white pus. This abscess continued to discharge daily and hourly until February 20th. The right ear discharged almost daily from January 15th to February 25th. The left ear discharged profusely every day from January 12th until March 1st, when it stopped suddenly. After the abscess in the neck was lanced the boy improved in strength and general health, although he was very much reduced in flesh. After the sore began to heal, and while the ears were still discharging, his general health and strength improved. After the ears ceased to discharge he improved very rapidly indeed, and seemed on March 15th very well, save that he could not walk without being supported. While the abscesses of the throat and ears were discharging the symptoms of the brain were not noticeable. Each day he would show new or different conditions. From January 15th to March 15th the size of the child's head diminished perceptibly. From March 15th to March 22d his mind showed no signs of failure, and he was wonderfully active, cheerful, happy, and without suffering of any kind. March 21st did not seem as well as usual; his head seemed to be more bell-topped than usual; his memory was not good; he was simply sluggish and had less strength; could not support his weight as well on his legs. An odor was

perceptible about the head as of an ulcer. March 29th caught a slight cold. April 2d a slight congestion of the front lobes of the brain set in, which gradually spread, involving the entire cerebrum. Death ensued April 4th. Age, three and a half years.

At death the boy was large and tall for his age. The bones of his body seemed well formed, although the muscles had become flabby by disease. A slight curvature of the spine was noticeable during the last few weeks.

Post-mortem.—The post-mortem was made thirty-eight hours after death, disclosing the following conditions:

Anterior fontanelle closed. Posterior fontanelle widely open. Edges of sagittal suture rounded and separated about one-fourth of an inch. Near the lambdoid suture evidences of previous inflammation of the bone. Calvarium very thin, in places transparent. Dura mater adherent whole length of sagittal suture and twice its ordinary thickness in region of posterior fontanelle.

Slight effusion and a little pus about optic commissure. Immense effusion in base of brain. Cerebellum firmly adherent to base of skull. Upon lifting out the cerebellum, there was found in its left hemisphere, and occupying nearly the whole of the left hemisphere, an encysted abscess, two and one-fourth inches wide, two and one-fourth inches long, by one and three-fourths inches deep.

All the ventricles distended and full of fluid.

Cerebral tissue much congested, but otherwise normal.

Fluid in brain, four hundred centimetres.

Weight of brain, fifty-two and seven-tenths of an ounce.

In this case several points of interest appear. From the post-mortem developments it is evident that at different times the brain and its membranes had been subject to varied diseased states. It is not possible to designate the exact time at which each pathological change occurred.

The extensive adhesion and marked thickening of the dura mater present positive evidence of a previous inflammation of this membrane. That this inflammation must have been slow

and chronic in its action is evident from the lack of symptoms indicative of acute inflammation. This might easily have been induced by its contiguity to the external abscess of the second period, the posterior fontanelle never having closed; the fever rigors and stomach troubles of the latter part of the second period and the first part of the third period undoubtedly being due in a measure, if not entirely, to this slow inflammation.

Why was there an arrest in the bony development of the cranium? All the other bones were well formed, and nothing in the history would seem to point to a tendency to rachitis, or in the case to indicate its presence. Unless the inflammatory action evidently so long at work in the region of the ulcer were the cause, we can assign no reason. Upon this point we should be glad to hear the opinion of the Fellows.

The abscess in the cerebellum from its being encysted was evidently not of recent formation. Upon this point Sir Wm. W. Gull says: "If the abscess have been formed some time, the pus is enclosed in a cyst of variable thickness." From an examination of this specimen, you will see that the cyst wall is firm and resisting.

What was the cause of this abscess? We are inclined to think that it originated in the diseased cranial bones, and may have been effected also somewhat by the fall which the child had upon the back of his head. Upon this point we quote again from Sir Wm. W. Gull: "Again abscess may be produced where there is disease of the cranial bones or some growth involving them, by the veins communicating with the diseased bone becoming plugged. The process of coagulation extends and invades the veins communicating with the sinuses of the dura mater. These becoming plugged, as also the veins of the pia mater, and probably some branches entering the brain tissue also, and inflammation, terminating in suppuration, is thence set up in the brain." That the abscesses in the ears, so often the cause, were not so in this case, is evident from their not occurring until months after the symptoms pointed to a diseased cerebellum.

The undulating, intermittent character revealed in the history of the case, show that the disease at times remained latent. That this is not uncommon we see from the following quotation from Huguenin. Speaking upon this point, he says (Ziemssen, Vol. XII., p. 762): "Latencies of absolute completeness have been seen, during which not a single symptom called attention to an intra-cranial affection (Bianchi and Merkie Schroeder Van der Kolk)."

Clear as the train of symptoms of a case of this kind may appear in the light of a post-mortem examination, they are not always as easy to explain in their progress during the life of the patient. That a variety of symptoms may be present in cases with almost identical brain lesions is seen from a glance at the analysis of the cases tabulated by Sir Wm. W. Gull. Much has been learned of the diagnosis of obscure brain lesions from the labors of Drs. Ferrier and Hughlings Jackson. Yet while, in nearly every case, from the nature of the disturbed function, we may be able to state the location, it is still impossible in all cases to positively assert the nature of the disturbing lesion. To differentiate between an abscess and a tumor of the cerebellum is always difficult, and at times impossible. In view of the difficulties which these cases present to the ordinary practitioner, the words of the learned Sir Wm. W. Gull are instructive and consoling. He says (Reynolds' System of Medicine, Vol. II., page 279): "There are no pathognomonic symptoms of abscess or of tumor. In abscess there is often marked cachexia and great emaciation. In tumor, the patients have often no marked cachexia, even look healthy, and the body is fairly nourished, certainly not emaciated. In abscess, the duration of the cerebral symptoms is generally much shorter than in tumor. The symptoms in abscess are usually either latent or acute; in tumor they are often chronic. In the latter there may be local paralysis extending over several months, which is very rare in abscess. The intra-cranial nerves are much more frequently affected in tumor than in abscess. Occasionally a person with tumor is seen to be much emaciated. These differences may enable the practitioner, in some cases, to diagnose one condition from the other, but in neither case are

these differences so constant that a certain diagnosis can be made."

It is to be hoped that future investigations will render all diseases of the brain as easy and certain of diagnosis as are now those of the lungs and heart.

In the discussion, *Dr. Guernsey* inquired whether it had been possible to elicit a history of syphilis, or of meningeal tuberculosis.

Dr. Butler replied in the negative, and in response to an inquiry of *Dr. Searle* as to whether an ophthalmoscopic examination had been made, he said that the nature of his case was such as to preclude the possibility of using the ophthalmoscope.

Dr. Fowler cited a case of cerebellar tumor, one of whose prominent symptoms was persistent vomiting.

Dr. Minor also referred to a patient suffering from a similar lesion, and directed attention to the fluctuations in the manifestations as being very remarkable, while the pathological conditions remained the same throughout.

Dr. Searle remarked that a large number of cases of cerebral abscess were due to *otitis media purulenta*, and thought that possibly in the case under discussion the original lesion might be sought for in the same condition.

The second paper of the evening was read by *Dr. F. C. Fuller*, on "Modern Antiseptic Surgery."

The title of "The Antiseptic Method" was given by Mr. (now Sir Joseph) Lister to a form of wound treatment founded on certain definite principles and commenced by him in 1865.

Previous to this time, although surgeons had studied wound treatment, and employed one form of dressing after another, there had been nothing established on scientific principles, and it was not until Mr. Lister, taking advantage of the experiments of Schwann, Schulze, Schroeder and Dusch, Pasteur and others, elaborated his theory and described his method of wound treatment, that antiseptic surgery really had a beginning.

Substances called antiseptics, and known to modify or arrest putrefaction in wounds, were employed, and with results calculated to encourage their use. These were various balsams, containing essential oils, alcohol, etc. Coal tar, in the form

of a paste, was employed in France, and this led to the use of carbolic acid. But to Mr. Lister is due the credit of establishing a fundamental principle and orginating a method of which all additions are only modifications. Mr. Lister himself has improved and modified his method of wound treatment, yet the technique is cumbersome, expensive and sometimes impracticable in private practice.

The wound treatment about to be described is, I think, more simple than the formal Listet method, and more adaptable to the uses of the surgeon, both in hospital and in private practice. I make no claim to originality in general in the dressing, but have taken occasion to include my own ideas on certain points, based upon an extensive comparative experience with this dressing and others, in the wards of Bellevue Hospital.

The secret of success in antiseptic surgery is the prevention of infection, and investigations of late years have been directed towards ascertaining what agent possessed that power to the greatest degree. Mr. Lister revived the use of carbolic acid when he expounded his grand method of treating wounds, and prescribed certain strengths for the different solutions employed. The use of carbolic acid has certain disadvantages, theoretical and practical, and other agents have lately been found more valuable. Estimating the value of different agents on a basis of their germicide power, I have copied from an article by Sternberg (U. S. A.), in the *American Journal of the Medical Sciences* for April, 1883, the following table:

VALUE OF GERMICIDE.

Mercuric bichloride, one part in	20,000
Potassium permanganate, one part in	833
Iodine, one part in	500
Creosote, one part in	200
Sulphuric acid, one part in	200
Carbolic acid, one part in	100
Hydrochloric acid, one part in	100
Zinc chloride, one part in	50
Tinct. of chloride of iron, one part in	25
Salicylic acid, dissolved by sodium borate, one part in	25
Boric acid, no value.	
Sodium borate, sat. sol., no value.	
Sodium hyposulphite, no value.	

We are immediately impressed with the high power of mercuric bichloride as a germicide, and it is to its equally high power as an antiseptic agent that I wish to call particular attention, as it is at present considered the best dressing, and the cases I shall report later on were treated by it.

De la Croix was one of the first to employ it, and in his paper contrasts it with carbolic acid, claiming it as a germicide to be two hundred and fifty times stronger than carbolic acid. Koch advocated its use and the German surgeons soon employed it as an antiseptic. It was soon introduced into this country and the results of its employment have more than gratified all anticipations. To return to carbolic acid, which should not be summarily dismissed even on the finding of a much better agent, its defects are quickly recognized in its volatility and its toxic properties. The latter are not especially dangerous to the life of the patient, but they excite anxiety in the mind of the surgeon and necessitate the substitution of some other agent in place of the carbolic acid. Eucalyptus is the agent generally employed by Mr. Lister, but its antiseptic power is slight compared with the other substances employed. It has struck me that the occurrence of poisoning in the use of carbolic acid depended considerably upon the susceptibility of the patient. Children are particularly sensitive to its action. I have never in any instance seen a case of poisoning occurring from the bichloride dressing in adults or in children.

The volatility of carbolic acid makes it unreliable in several ways. A carbolic acid dressing aseptic at the time of its application loses its virtue and becomes neutral or septic from the evaporation of the drug. The principal difficulty encountered is that the carbolized materials, gauze especially, purchased at the shops, do not retain the drug they are charged with, and on analysis are found to be wofully deficient in strength.

The volatility of mercuric bichloride is very slight. In addition to the volatility and toxic property of carbolic acid, its effect on tissues, in strength sufficient to act as an antiseptic, is such that renders healing tardy and imposes extra labor upon

the surgeon. The effect of the application of carbolic acid to cut or wound tissues is to produce a flow of serum from their surfaces in quantities quite astonishing. With free drainage provided, this is not directly detrimental to the wound, but it frequently necessitates the re-application of the dressing, therein indirectly injuring the patient by the pain produced, moving of the parts, etc.

It is generally found necessary to change a Lister dressing within thirty-six hours after its application, on account of the free serous discharge existing.

In the cases later to be cited, treated with bichloride, it will be seen that many of them went for several weeks without being re-dressed.

I do not consider it necessary to compare the remaining germicides in the above table with one another, as carbolic acid and bichloride are more often employed in a proportion of one hundred times to one than they. Suffice it to mention that salicylic acid and boracic acid, although of low germicide power, are by preference employed in operations involving the opening of the peritoneal cavity or any other very large absorbing surface. It may be well to take up in detail the steps of an operation conducted on antiseptic principles, as there are many points of the utmost importance that should be carefully observed outside of the mere employment of the antiseptic agent. In the first place, the region of the part to be operated upon should be thoroughly cleansed with soap and water, and a scrubbing brush also, if possible, then disinfected with bichloride or carbolic acid. To use extreme care, the deep disinfection of the skin with a solution of ether, or iodoform in ether, may be made. The neighboring region should be protected with towels wrung out in bichloride or in carbolic acid. It matters little what antiseptic is employed for outside disinfection. The instruments should be thoroughly cleaned, and kept in a solution of bichloride or carbolic acid; the latter is preferable, as the mercury stains instruments badly. The hands of the operator and of his assistants are thoroughly disinfected, and the operation should be conducted under almost

continuous irrigation. This is easily done by having a convenient vessel placed at an elevation higher than the patient, with a rubber tube leading to the table. Rubber cloths carry the waste to a bucket. The irrigating solution should be mercuric bichloride, 1-1200 or 1-2000, as the conditions of the case in the judgment of the operator may indicate.

The irrigator has many advantages over the spray. It is not in the way of any one, and there can be kept up a continuous or frequently intermitting stream on the wound. It washes away the blood and detritus, and obviates the necessity of frequent sponging. The effect of the bichloride solution on the tissues is most important and stands in strong contrast to that of carbolic acid before referred to. A coagulation of the albuminous elements of the tissues seems to take place, and by arresting the oozing, the wound is comparatively dry at the end of the operation.

For the ligation of vessels, catgut antiseptically prepared should be employed. That prepared after Lister's formula is satisfactory, but Kocher's seems to fulfill all requirements best. This is the soaking of the gut in oil of juniper for forty-eight hours, after which it is kept in alcohol, a little glycerine being added. Infection of the wound by catgut has occasionally occurred, but the reports of it are infrequent. Gut soaked in a strong solution of mercury would be freed from every element of danger, but its texture would stand in danger of being impaired. *Perfect* drainage is an essential, and many substances are in vogue, spun glass, horse hair and catgut, but tubes, either of rubber or decalcified bone, are the most reliable. They should be kept in antiseptic solutions until required for use. The rubber tubes keep patent and can perhaps more safely be relied upon, but the use of bone tubes does away with the necessity of removing them, they being absorbed at the end of a week, when the necessity for their presence has passed; consequently many wounds can be healed under one dressing. The suturing of a wound should be made when possible with catgut, and the continuous suture acts admirably and can be more rapidly

made than the interrupted. The gut beneath the skin is absorbed, and that on the surface dries and drops off. Over the wound iodoform should be dusted, a piece of Lister's protective or rubber tissue applied and more iodoform dusted on. The incorporation of iodoform in a dressing I believe to be a great aid in the maintenance of an antiseptic condition. It retains its strength for a long time and is one of the most valuable antiseptic agents we possess. It can be dusted on the wound and through the dressing or the iodoform gauze can be employed—gauze containing two to five per cent. of iodoform in its meshes. The part of the dressing which is placed over the tubes or the surface of the wound should be slightly moistened, that it may more readily absorb the discharges than if they emptied into dry material. The dressing, although important, may be any material possessing absorbent properties and in a measure antiseptic. Peat is the absorbent par excellence, having the property of absorbing eighty parts of water, and may be used alone or combined with mercury or iodoform. It is sewed in bags of different sizes; the smaller ones are first applied to the wound, closely surrounding it, and a larger bag covers the whole and firmly bandaged. Sawdust prepared in bags in a similar way may be employed, or even sand. My favorite dressing is the use of bichloride gauze around the wound, dampening it to assist absorption, and the employment of boracic acid cotton for the bulk of the dressing. It makes an even, firm dressing, and is the most available. I employ iodoform with it in proper situations.

I have endeavored to make it plain that the essentials of success in antiseptic surgery are an absolutely aseptic condition of the wound when it is closed and the dressing applied. The form of the dressing is immaterial as long as it is absorbent and antiseptic, but the wound must be aseptic, free from infection when it is closed. Drainage is necessary, and rest for the parts during healing is required.

To illustrate the principles before mentioned and to demonstrate the success of this form of wound treatment, I propose

to cite some cases from the history books of Bellevue Hospital, and a few from my practice since I left the hospital. They are ordinary cases; not some that have done exceptionally well, but are cases that illustrate the application of antiseptic surgery to various operations occurring in practice.

CASE I. *Amputation of Thigh, Healing under one Dressing.*—John M., aged twenty-eight. Laborer. Operation June 23d, 1883. Patient had been under treatment in the hospital for the preceding six months. His affection was chronic strumous arthritis of the knee joint, which originated in an injury to his knee some months before. It had obstinately resisted the treatment pursued, and the condition steadily progressed. An operation, consisting in opening of the joint and scraping out the fungoid masses, had been performed. The bacillus tuberculosis was found in the pus within the joint, and he had commencing phthisis of the lungs, but was in a fair condition. At the time of the amputation the capsule of the joint had ruptured, admitting pus into the lower part of the thigh and into the leg. Sinuses led down to the carious joint, and the possibility of saving it being hopeless, amputation was decided upon. On June 25th I amputated the thigh at the junction of the middle with the upper third. The preliminary steps to the operation consisted in shaving the thigh, scrubbing with soap and water, and thorough disinfection with 1-20 carbolic acid. The limb was surrounded with towels wrung out in a solution of carbolic acid, and the operation was carried out under frequent, almost continuous, irrigation with bichloride of mercury solution 1-2,000. The instruments and the hands of all engaged in the operation were disinfected with carbolic acid solution, and the sponges and catgut were antiseptically prepared. The form of amputation employed was the modified circular skin flaps, the anterior being the longer. A periosteal flap was made from the anterior surface of the bone. An Esmarch bandage was employed, and nearly all the blood vessels were tied before it was removed, careful searching revealing the open mouths of even the very small arteries. In this way very little blood was

lost on removal of the Esmarch. Firm pressure exerted on the stump with sponges controlled the oozing, so that when the flaps were brought together the wound was almost absolutely dry in a vascular sense. I consider this a great desideratum, and one of the requisites for rapid healing. An amputation having a large blood clot beneath the flaps seldom heals kindly. The ligatures were of catgut prepared after Lister's formula, two sizes being used, for the large and small vessels respectively. A drainage tube was carefully placed in each extremity of the wound, and the flaps brought together with catgut employed in the form of a continuous suture. The edges of the flaps were carefully trimmed of all loose adipose tissue and perfect coaptation secured. This clearing of the skin borders of all loose ragged tissue is very important if primary union is expected. The continuous suture is very convenient in sewing long wounds, as it can be rapidly made and it secures excellent coaptation of the surfaces. Care should be taken not to draw the suture too tightly. The drainage tubes employed were of decalcified bone, said to have been prepared after Neuber's method. My own experience in preparing tubes after the method described by him has been unfortunate, as has also that of others who have repeatedly tried the same. The formula which I *have* found successful is as follows: Take the bone tubes—chicken bones, or, what are better, tubes turned out of oxen's tibiæ, they have the advantage of uniform size and calibre. Place them in a ten per cent. solution of hydrochloric acid until the bone salts are driven out and they are soft and pliable. Fenestrate them, then place them in oil of juniper for twenty-four hours, after which time they are to be kept in dilute alcohol. As I said before, two tubes were used in this case. They were prevented from slipping into the stump by a small safety pin, passed through their surface ends at right angles to them. The dressing prevented their escape *from* the stump. The cavity of the stump was flushed with bichloride solution and the dressing applied. The wound was first dusted with iodoform, and a narrow strip of protective applied to the united edges to prevent irritation from the dressing. Rubber tissue

will do as well for this purpose. A pad of loose antiseptic gauze was next applied over the ends of the tubes, moistened in bichloride, to assist drainage. Suitable and correctly directed pressure was then made on the stump with more gauze, and the bulk of the dressing was then applied. In this case borated cotton was used, and I think it is as good as anything we have. Peat is excellent; it has a high absorbing power, and can be applied directly to the wound. Cotton directly applied to the wound only imperfectly absorbs serum, and requires a certain amount of gauze, or, what is better, moistened gauze, between it and the wound. Sawdust in bags and sand have been employed, but with only fair success, the former after a short time giving out a strong sour odor, even though there be no putrefaction in the wound. The latter, sand, is uncomfortably heavy. Peat would be more largely used if it were obtainable in a pure state in this country, but at present it is all imported. I experimented with some I obtained from Fisher's Island, Long Island Sound, but found it far from satisfactory. To return to our case. The bulky outside dressing of cotton was applied and fixed with a gauze bandage, and more strongly secured with a spica starch bandage. He was put to bed, the stump slightly elevated, and a light sand bag placed on the stump to relieve muscular spasm, which it quite effectually controlled. He rallied well from the operation, and suffered comparatively little pain. His highest temperature range was 100½ degrees on the third day, when he was suffering from slight surgical fever. On the seventh day it was normal and so continued.

July 8th, two weeks after the operation, the dressing was removed and the stump found completely healed. Even the sinuses formed by the drainage tubes had closed, a small piece of bone tube, with its safety pin, being found at each extremity of the cicatrix. The dressing was stained with dried bloody serum for about two inches from its interior, but no pus was to be seen. The wound had healed by primary intention. Slight support was continued on the stump and the patient kept

in bed for one week longer, when he was permitted to get up.

CASE II. *Compound Depressed Fracture of the Skull. Operation, Healing under two Dressings.*—Edward H., aged seventeen. Painter. Entered Ward Ten, June 20th, 1883. As the case is interesting on account of showing symptoms due to pressure on the cortex of the brain, in its motor area, I will give a somewhat detailed history of his injury and symptoms.

Shortly before entrance to the hospital he was struck on the head by a falling brick, receiving the blow on the right side between the parietal eminence and the median line. He was knocked to the ground senseless, but shortly recovered consciousness. When admitted, patient was in no shock; his pulse was full, regular and strong, about eighty per minute. Pupils were equal and responded to light. He was conscious and answered questions intelligently, but seemed to be dazed and stupid. Complete paralysis of the left upper extremity, partial paralysis of the left lower, and of the left side of the face, were present; sensation normal. On the right side of the head, about two inches from the median line, was a lacerated wound of the scalp, two and one-half inches long, extending downwards and backwards to a point about one and one-half inches behind the right ear. At the bottom of this wound depressed bone could be easily felt. The patient was etherized, and the head shaved and thoroughly disinfected. The wound in the scalp was then extended toward the median line. An elliptical piece of bone was found depressed. There was a fracture of the bone extending downwards and forwards from the elliptical piece, and this was somewhat depressed. The elliptical piece was removed and the other depressed bone was elevated. The edges of the firm bone were made smooth. Portions of the inner table were removed, because they were depressed and loose. A small wound in the dura mater was discovered, near the superior longitudinal sinus. The remnants of the periosteum were drawn over the bone, the slight hemorrhage was controlled with ice. The flaps were sutured with catgut, three short rubber drainage tubes being placed in the wound. The entire opera-

tion was done under irrigation with bichloride solution, 1-2,000. The wound was thoroughly cleansed before it was closed. Iodoform was dusted over the tube ends and on the edges of the flaps, and a piece of protective covered them. A ring of antiseptic gauze was placed around the wound, and loose, moistened gauze filled its centre. Over everything was placed a thick dressing of borated cotton. A capitellum bandage, with extra turns under the chin, completed the dressing. This was the first case of trephining in which I had known the scalp to be sutured with the idea of obtaining primary union at all points, excepting, of course, where the drainage tubes emerged. It is very possible that it has been done, but it had been my experience to see all cases treated by loosely suturing the points of the flaps, or by leaving the wound open, packing it with gauze or lint, dry or saturated with some styptic or antiseptic solution. Cases treated in this manner are very slow to heal; a homely elevated wound, with inverted edges, remains, and, in two instances, I have seen necrosis of the bone around the trephined area follow. Treated antiseptically, carefully suturing the flaps after trimming the ragged edges, primary union is almost ensured. I will cite some cases of severe scalp wounds so treated later on. The patient recovered from the ether well. He was placed on moderate doses of bromide of potassium, and began a favorable convalescence. His hemiplegia gradually disappeared, the leg regaining its power in about a week, the arm somewhat later. He did not have a temperature of over 100 degrees during his illness. The dressing was changed on July 5th. Removing the drainage tubes, the sinuses were dusted with iodoform, and a light dressing reapplied.

July 10th.—Dressing removed. Wound entirely healed. Patient was kept in bed several weeks longer, but no symptoms developed. I saw him a short time ago, and he is perfectly well, working at his trade of painter. No reproduction of bone has taken place, yet it was hardly to be expected, considering the large area of bone removed, the space measuring an inch and a half in length and over an inch in width.

CASE III. *Compound Depressed Fracture of the Skull. Operation, Healing under one Dressing.*—James W., aged five years. Entered Ward Seven, Bellevue Hospital, October 31st, 1883, with a history of a piece of brown stone falling upon his head a short time before, from a balcony railing ten feet above the ground. There was a ragged wound about an inch in length, at the bottom of which could be felt the depressed bone. There were no brain symptoms. The child was in no shock. He was immediately etherized ; the head shaved and cleansed as in the previous case. The operation was begun by extending the wound an inch in either direction, when the extent of the depressed area of bone could more plainly be made out. It was about an inch in diameter and made up of many small fragments. I found it unnecessary to employ the trephine, being able to raise and extract the fragments by means of the bone elevator and sequestrum forceps, and the ragged borders of the bone I made smooth with the Rongeur forceps. The dura mater was not injured. Before and during the operation the parts were irrigated with bichloride solution. The edges of the wound were trimmed, and the aponeurotic layer, together with the periosteum, brought together with one deep row of sutures, and the skin layer with another. The wound was so dry and clean that I ventured to omit the use of drainage tubes, classing it as I would a simple scalp wound. It was dressed with iodoform, gauze and cotton, and a starch bandage applied. The dressing was not removed until the eighth day after the operation, when the wound was found in a condition of complete union. Not a single unfavorable symptom developed during the progress of the case, and no dressing was required after the first one was removed.

The case was exhibited at the meeting of the Surgical Society, on the thirteenth day after the operation.

CASE IV. *Compound Comminuted Fracture of Left Patella; Wiring of Fragments; Bony Union.*—Alex. C., aged forty-five. Contractor's foreman. Entered Ward Eight, July 22d, eleven P. M. About two hours before, when under the influence of liquor, he fell from the second story of a building, striking his knee on

an iron grating covering a coal shute. On entrance patient still alcoholic. Examination revealed a compound comminuted fracture of the patella. The wound was on the front of the joint, directed downwards and outwards, somewhat ragged, and one and one-half inches in its long diameter. A temporary dressing of iodoform and bichloride was applied for the night; a posterior splint and an ice cap. On the following day, Dr. McBurney, visiting surgeon, being engaged in a private operation, he directed me to attend to the case. After the usual preliminary arrangements, the extremities of the wound were extended, the incision then being oblique to the axis of the limb. The capsule was found only moderately lacerated. This moderate degree of laceration I believe to be the case in fractures due to direct violence. The lower half of the patella was found badly comminuted, and the fragments so loosely attached to the periosteum that it was found necessary to remove all but two pieces. The larger of the two was about the size of an ordinary chestnut; the smaller, half that size. The patella now consisted of three pieces, the upper fragment comprising a little more than one-half the bone. With a common brad awl I then drilled one channel in the upper fragment, the drill passing obliquely down to, but not through, the articular cartilage. A corresponding channel was bored in the larger of the two lower fragments, and they were brought together with a suture of silver wire. The hospital wire was so fine and brittle that I was obliged to use it double. The smaller lower fragment I found was best kept in position by suturing it to the larger lower fragment. For this I used a large violin string, which I had prepared and made aseptic after Kocher's method. The next step was to wash out the joint, which I did through a Nélaton catheter, using the bichloride solution. Sir Joseph Lister, who has performed this operation oftener than any other surgeon, does not mention this step in his description of his operation, and I am told that he does omit it; but it seems to me that freeing a joint of blood clots and bloody serum renders it purer than it would be if they were permitted to remain in.

Next, the insertion of the drainage tubes and the suturing of the capsule occupied my attention. The wound in the capsule was about an inch in length on either side of the patella, and I was satisfied to place a drainage tube at each extremity of the wound, believing that with the subsequent elevation of the foot the tube would be at nearly the most dependent portion of the joint. The tubes were of rubber, medium size, and their inner ends were just within the capsule, not more. I then, with catgut, sutured the capsule, finding no difficulty in taking it up laterally to the patella, and in front of the bone where it is continuous with the periosteum, it can be sewed with little trouble. This suturing of the capsule I regard as a very important procedure. Sir Joseph Lister omits it in his description of his operation, and I believe, also, in his practice; but to my mind it is one of the most important steps in the operation. If the capsule is well sutured, the joint is practically closed and shut, and what serum exudes or synovia forms drains through the tubes into the dressing, and not into the loose cellular tissue between the capsule and the skin, where it must drain if the capsule is not sutured. Again, with the capsule sutured, it heals independently of the skin, lessening the danger of an adherent cicatrix. Moreover, the soft tissues in front of the joint must be thicker and stronger with a sutured capsule than without it. The ragged edges of the skin were trimmed and then united with catgut. Three short drains, leading into the areolar tissue, between the skin and the capsule, were employed. I neglected to mention that the disposition I made of the twisted ends of the wires was to turn them down between the fractured surfaces. I think this preferable to hammering them into the anterior face of the patella. Of course it is intended that the wire should remain permanently in the bone. When drawn tightly, and the ends disposed of as above, it becomes embedded in the bone, and I have never heard of its causing trouble in patellæ, or in long bones, where I have employed it in resections. If the wire is employed for a temporary purpose, complete healing of the skin is delayed and its removal is not

always an easy matter. A final washing out of the joint through the tubes was made, the fluid running through clean and clear. The tube ends and the wound were well dusted with iodoform, and a gauze and cotton dressing applied. An anterior plaster of Paris splint was employed, reinforced with a wire gauze frame. Patient put to bed, and the leg suspended at an angle of forty-five degrees. No special after treatment was employed. Patient's temperature never went above one hundred degrees, and after the fourth day it was normal.

August 7th.—Fifteen days after the operation the dressings were changed to remove the tubes. Primary union of the skin had taken place. The joint looked normal.

August 17th.—Again dressed, and the sinuses formed by the tubes were found closed.

August 24th.—Splint removed and patient allowed to move the leg as much as he felt inclined. Motion was gradually established, and October 15th patient was discharged cured No passive motion had been employed, and he could flex his leg to a right angle with the thigh, and there was no doubt but that there was bony union. One leg was as good as the other.

CASE V. *Wiring of Simple Fracture of Left Patella, due to Muscular Action. Wide Laceration of the Capsule.*—Jas. S., aged twenty-three. Watchman. Entered Ward Ten, September 6th. The history pointed directly to a fracture from muscular action. Up to the day of the operation, patient was treated on a posterior splint, with foot elevated and an ice cap over the joint. September 14th, the inflammation having nearly subsided, I proceeded to wire his patella. A transverse incision, about one and one-half inches in length, was first made, and either extremity of it extended until the incision in the skin corresponded to the rent in the capsule. This was nearly four inches in length. I would digress from the description of the case to discuss the relative merits of the vertical and the transverse incision. In this case especially, and in the two others, to a greater or less extent, a vertical incision would not have permitted me to examine the torn capsule, or the joint, or the fractured bone as I desired to.

Sir Joseph Lister and the other gentlemen in Great Britain who have done this operation, all employ the vertical incision, and it is noticeable that they omit to say anything about the capsule. If the capsule is disregarded, the vertical incision is all-sufficient for purposes of wiring the bone, and leaves a smaller and perhaps a better situated scar than does the transverse incision; but to my mind the capsule is all-important, and the incision through the skin should be made to facilitate getting at it for the purpose of suturing it. In a fracture due to direct violence, be it simple or compound, the vertical incision may be sufficient, for in such a case the rupture of the capsule is insignificant; but in a fracture from muscular action the transverse incision will be necessary, as the capsule in that class of cases is widely ruptured. To return to the case, the direction of the fracture was transverse and exactly through the middle of the bone. The separation of the fragments was about an inch. Fringes of aponeurotic and fascial structure hung down between the fragments, and on each fractured surface was a blood clot so hard and tenacious that it could only be detached by means of a sharp spoon. Underlying this was healthy bleeding bone. The joint contained blood clots and bloody serum. It was washed out as in the first case. Two wires were employed, the fragments accurately adjusted, and the wire ends thrust down between the fractured surfaces. The edges of the capsule were trimmed, sutured with one line of catgut, the skin with a second. A similar arrangement of tubes as in the first case. Dressing, the same. The patient's lightest temperature was 100.5 degrees. Dressing changed and tubes removed on the eleventh day. A narrow line of the sutured integument had sloughed, probably due to pressure over the patella from the dressing, but a few skin grafts rapidly closed the ulcer. At the end of seven weeks patient was allowed to walk about the ward, the joint being kept stiff by light pasteboard splints. At the end of the eighth week motion commenced, and Nov. 29th patient was discharged with thirty degrees flexion, increasing every day from simply walking upon his leg. Patient is a professional base ball player, and now runs well, feeling his leg to be as strong as ever.

CASE VI. *Wiring of Simple Fracture of Left Patella.*—Charles R., aged twenty-four. Driver. Entered Ward Ten, October 9th, 1883. Operated upon twenty-four hours after injury. It was with some trepidation that I operated in this case so soon after the injury; but I looked upon it as a radical way to relieve the inflammation then commencing in the joint, and that it was successful, is proven by the fact that, when I removed the dressing at the expiration of twelve days, the circumference of the joint was four inches less than when the dressing was applied. In this case the lower fragment was very small and tilted so that the broken surfaces were greatly at variance with each other. This class of cases, although not so pleasing to operate upon, are surely the most appropriate, as it is difficult to imagine a good result accruing from any treatment that would not direct the fractured surfaces in a measure towards each other. Treated in the ordinary way it is impossible to do this, the lower fragment being so small that one is unable to obtain any purchase upon it. Two wires were introduced and a mortise cut in the upper fragment to partly contain the lower, good opposition being obtained. The rupture in the capsule in this case was at least three inches, and was treated similarly to the others. As stated above, the case was dressed on the thirteenth day. Primary union of the skin was perfect. His temperature was once 101°, at all other times not above 99.5°. Patient allowed to walk about ward with knee kept stiff by splints at seventh week. At present there is no indication, except by the scar, that his patella had ever been fractured. I have seen him within the past few days, and he walks without the least perceptible limp or halt, and he has free and perfect motion in the joint, flexing his leg even more than at right angles with his thigh.

CASE VII. *Ununited Fracture of Fore-arm. Resection; wiring; healing under two dressings.*—R. A., aged forty-five; admitted to Ward Ten, July 26th, 1883. There was an ununited fracture of the radius, for which rubbing of the bone ends, boring, etc., had been tried without result. A longitudinal incision was made over the radius at the seat of fracture. The soft parts being separated

from the bone, the ends were sawn off obliquely by means of a Hey's saw. The fragments were then approximated and fixed with a silver wire suture. Rubber tubes were introduced and a peat dressing applied. The arm was supported by a rectangular splint of wire netting on the anterior surface of the limb, covered with a crinoline bandage, and swung in a pasteboard support.

August 11th.—Peat dressing and drainage tubes removed; gauze dressing reapplied.

September 11th.—Dressing removed; wound healed; union in fracture good. Discharged cured. Had bone tubes been employed the case would have undoubtedly healed under one dressing.

CASE VIII. *Incised Wound of Wrist. Suturing of Tendons and the Median Nerve.*—Thomas P., admitted May 18th, 1883. There was an incised wound, a glass cut on the anterior face of the wrist, severing the median nerve and the superficial tendons. Wrist shaved and cleansed with bichloride. The nerve was sutured with catgut, the tendons with the same. The hand was flexed on the fore arm, and fixed with an anterior and a posterior splint.

May 25th.—Secondary hæmorrhage occurred from the anterior carpal artery. This caused the separation of about one-half of the skin flap. The hæmorrhage was checked and a similar dressing applied.

June 5th.—Re-dressed; primary union in one-half of the wound, the remainder granulating well.

June 26th.—Discharged. Sensation in the parts supplied by the nerve was fairly good, and he had only slightly impaired motion of the fingers.

Wounds necessitating the suturing of nerves and tendons are an excellent and appropriate field for the application of antiseptic methods. Healing with the least amount of inflammation is the desideratum. Protracted healing, with free suppuration, in a case of division of the tendons, would be fraught with dangerous consequences. Immediate union without pus offers the best chances for recovery with the possibility of return of

function. I have a case in mind—the history has been lost—of a double wound of the wrist, severing all the dorsal tendons at two different points. The man's hand was caught beneath the double blades of a meat chopping machine. The upper incision was a transverse one at the lower end of the radius, severing all the dorsal tendons and the radius itself completely through at the junction of the epiphysis with the shaft. The hand hung simply by the soft parts on the anterior surface of the wrist. The second incision was at the base of the metacarpal bones, severing all the extensors of the fingers, and producing a compound fracture of four of the metacarpal bones. The case was treated after Lister's method, and made a fair recovery. The tendons were fished for upwards and downwards and united with catgut, tubes inserted, and the skin wounds sutured. Some slight necrosis of the radius ensued; but he has a useful hand, with only comparative impairment of function.

CASE IX. *Compound Fracture of Leg. Resection of Tibia; Wiring of Fragments.*—M. W., aged fifty. Admitted to Ward Ten, May 3d, 1883. Patient had a very bad compound fracture of the lower third of the tibia. The line of fracture was very oblique and could not be kept in position, marked overriding occurring, with gouging and laceration of the soft parts by the sharp spiculæ of bone. The wounds leading down to the bone were enlarged, and the very loose spiculæ removed. The ends of the main fracture were apposed, and, boring holes, two copper wire sutures were introduced, fixing the fragments steadily. Counter openings were made, drainage tubes inserted, the wound sutured and the usual dressing applied, and the limb from the toes to the groin fixed with an anterior plaster of Paris splint.

This dressing was not removed for four weeks, when the parts were found in an excellent condition. His recovery was rendered somewhat tedious by the occurrence of slight necrosis of one fragment; but he ultimately obtained a very satisfactory result.

CASE X. *Bow Legs. Double Osteotomy of Tibiæ.*—Anæstasia M., aged four. Was operated upon October 25th. The operation

was a simple osteotomy of the tibia after MacEwen's method, except that the incision through the skin was made transversely, instead of vertically. This modification of the skin incision was was first employed, I think, by Dr. McB., and to my mind is a great improvement over the vertical cut. Its advantages are, that there is less laceration of the tissues, all being cut in the same direction, and primary union is rendered more sure. Hæmorrhage is only insignificantly increased in this incision, there being no vessels of importance in the region over the tibia. The periosteum was divided with the point of the knife, the bone cut about two-thirds through with the chisel, the remaining one-third being fractured. The limb being kept straight and all hæmorrhage arrested, a couple of catgut sutures approximated the lips of the wound, and a light dressing was applied, covered with a plaster of Paris bandage. The operation was done under the irrigator with the usual precautions.

November 15th.—Splints and dressing removed; wound entirely healed. A light splint reapplied.

November 26th.—Allowed to walk.

I have operated upon over a dozen pairs of bow legs and as many knock-knees in this way, and have never suffered any accident. In one case, osteotomy of the femur for knock-knee, the child developed measles the day after the operation, and an abscess formed in the soft parts about the wound, but made a good recovery. In one other case there was slight suppuration in the thigh, but never any serious trouble. The tibia cases invariably do well. Plaster of Paris is the best fixation splint, and young children I treat with vertical extension of the legs and thighs after Kümmel's method. They are much quieter this way, do not soil the splints, and do not suffer venous stasis at the seat of injury.

The last case I will cite is one now under treatment, a case of excision of the knee joint for chronic dislocation, and I am glad to be able to present it, illustrating as it does the feasibility of carrying out antiseptic methods in private practice, or even

tenement house surroundings, this case occurring in a very ordinary one of that class.

Richard M., aged 16 years, suffered when three years old from what was probably suppurative arthritis of the knee joint. The joint was several times opened, and large amounts of pus evacuated. He recovered without further treatment, but on beginning to walk dislocation of the thigh from the leg commenced. This gradually became worse, and at the time of operation walking was almost impossible. On placing the foot on the floor the limb would bow outwards, the femur projecting outwards and downwards over the tibia and fibula. I decided to do a formal excision of the joint, fasten the femur to the tibia, and secure a useful limb with a stiff joint. Accordingly on February 25th the patient was etherized, the limb thoroughly cleansed and protected with wet towels; a water bucket, containing the bichloride solution, with a long piece of drainage tubing acting as a siphon, served as the irrigator, and two oil-cloth table covers in lieu of rubber blankets. A transverse incision was made over the upper end of the tibia, the ligamentum patellæ and the capsule cut and the joint laid open. Evidences of an old arthritis were present—the patella was much reduced in size, the cartilages were absent and the joint was filled with old adhesions and adventitious tissue. The bony outlines were abnormal, the external condyle being much the longer, having had no resisting force to its growth on account of the dislocation. The patella was excised, together with considerable soft tissue. A transverse section was removed with the saw from the lower end of the femur and a corresponding piece from the upper end of the tibia. The sawn surfaces came accurately together. To facilitate rapid union I wished to fix the femur and tibia firmly together, and for this purpose I used steel spikes two inches long, shaped like a French nail, but with beveled points. One I drove from above downwards through the external condyle of the femur into the tibia, the other from below upwards into the inner condyle. This quite firmly fixed the limb. Counter openings were made at the most dependent point of the wound

on either side and decalcified bone tubes inserted. I found it necessary to place a tube in front in the situation of the excised patella, and having run short of bone tubes was obliged to use a rubber one. This emerged on the front of the thigh, about two inches above the incision. Elevation of the leg promoted drainage from this tube. The edges of the flaps were trimmed and united with a continuous suture of catgut. Iodoform, protective and moist gauze formed the under dressing, borated cotton the outer and heavy dressing. A plaster of Paris bandage, reinforced with pieces of barrel staves, formed the splint, extending from the toe to the groin. He was put to bed, and the foot elevated to an angle of forty degrees. His highest temperature was 101 degrees, but subsided to normal on the fifth day. Two weeks after the operation, I cut a small fenestrum in the anterior face of the splint and dressing over the rubber drainage tube and removed it, dusted some iodoform on the sinus and replaced the dressing. I shall not remove it until the expiration of six weeks, when I will replace it with a lighter splint.

This is an operation that twenty years ago was condemned by surgeons, here performed in a tenement house, with the worst possible hygienic surroundings for the patient; but the wound, aseptic at the time it was put up, remained so until it healed, and to have the wound aseptic at the time the dressing is applied is the secret of success in all cases.

The allotted time having expired, the discussion was postponed.

Stated meeting, June 10th, 1884.

Dr. Hallock in the chair.

Dr. Fowler reported a case of a lady thirty-five years old, the mother of four children. When twelve years old she suffered from scarlet fever, and since that time has passed an average of six ounces of urine in twenty-four hours, often passing only two ounces in twenty-four hours. The urine is normal in appearance —S. G., 1020–1024. Normal on chemical analysis. A casual microscopical examination revealed nothing abnormal. She is in

robust health. No abnormal avenue of escape for the urine can be found. No explanation of the condition is offered.

Dr. Fuller exhibited a patient upon whom, three months previously, he had performed the operation of excision of the knee joint. The case was a boy, aged seventeen, who, when three years old, suffered from suppurative arthritis of the left knee, following scarlet fever. The joint was opened several times and large amounts of pus were evacuated. He recovered, and later began to walk. The ligaments and cartilages being destroyed, dislocation of the femur outwards from the tibia and fibula commenced, and at the time of operation was complete, he being unable to walk. Complete excision of the joint, with removal of the patella, was practiced, and the femur spiked to the tibia by means of two steel nails. Complete antiseptic precautions were observed, and all healed under one dressing, the dressing and splint not being removed for six weeks. The boy is now able to walk and run, and suffers no pain in the limb. A mounted specimen was also shown, the patella and sections of bone removed at the operation.

Dr. Wilcox exhibited the greater part of the necrosed shaft of a tibia which he had removed a few days before at the Hahnemann Hospital. The patient was a boy of nineteen years, and the cause of the necrosis was syphilis. This he contracted, having had but one connection with a woman. The disease had run through the usual stages, but had been neglected at first, and subsequently treated by a quack, who did him no good. When first seen by the speaker the tibia was exposed for a space of about two square inches. The patient was operated upon by making a longitudinal incision from the ankle joint nearly to the knee, and stripping up the periosteum, and dissecting off the attachments of the muscles in the usual manner.

The lips of the wound were brought together by wire, silk and catgut sutures; the limb was placed in a posterior splint, and three drainage tubes introduced. It was dressed and washed with preparations of corrosive sublimate. At first the suppuration

was profuse, but was much diminished later on, the wound healing with marked rapidity. The patient experienced but little pain, slept fairly well; his appetite was good and with the exception of the first day the temperature had not reached 100°. The speaker attributed the good result, in great measure, to the employment of antiseptic measures, and had confirmed his opinion by similar satisfactory results in other cases.

Stated Meeting, November 11th, 1884.

President Searle in the chair.

Subsequent to the transaction of routine business, the President, in pursuance of the regular custom, presented the subjoined Annual Discourse, choosing for his subject, "What is Fittest in Homœopathy, and Likely to Survive?"

Dear Colleagues :

The ides of November have come; the current year is closing; and the address of your President is this evening due.

Let us first return thanks that our circle has not as yet been invaded by death. But around some, and, perhaps, not the oldest in years, the shadows begin to gather and darkness approaches. With which of us this is the case God only knows. In this blessed uncertainty all alike partake. And, therefore, to each is the solemn admonition appropriate: "Behold, the night cometh."

The past ten meetings, which make up our current year, have witnessed no abatement of the interest with which we have all regarded this association. Important and instructive papers have been ready at every gathering. New members in sufficient number have been added to our roll. Friction has worn off the roughness in our new machinery, and so adjusted its various parts that all work smoothly and harmoniously.

I think we may congratulate ourselves that the work upon which we entered with enthusiasm six years ago in founding this society, was wisely planned and timely commenced. The professional field was ripe for just such an association. As we intended, it has furnished a rendezvous where liberal minds,

ignoring partisanship, could engage in earnest work for the good of the profession, for their own cultivation, and for the benefit of those entrusted to their care.

And since it meets a want and fills a gap hitherto unoccupied, and does so satisfactorily, we need not fear for its future. For the present certainly, and hopefully for coming years, it is one of the "fittest" and will "survive."

In surveying the professional arena as it appears to-day, and selecting from among those subjects which more immediately and intensely concern the physician, I have thought that, perhaps, none is more apposite for discussion at this hour and in your presence than this: *What is "Fittest" in Homœopathy, and What is Likely to "Survive"?*

Sixty years have elapsed since the introduction of Homœopathy into this country. To those whose lives have been of equal or greater duration this does not seem very long. And yet, sixty years cover no inconsiderable portion of the world's history. Looking backward over five such periods, we behold America a perfect wilderness. Thirty such lives take us back through the entire course of modern civilization—even to the Christian era. Sixty years, then, embrace no small portion of the history of medicine. And for that space of time Homœopathy has been on trial in this country.

Now, if I correctly read the "signs of the time," the present may be justly considered a transition period in the history of this form of medical art. Whatever is true in Homœopathy, what has stood the test of modern scientific thought and experiment, is gradually being accepted by the medical profession in general. And what is fanciful and false has been or is being rejected by the Homœopathic school itself. The long *un*civil war is over; the line of battle is broken; the pickets are fraternizing; the generals exchange courtesies. As the years pass on, and new generations spring up, the old factional bitterness is subsiding; progressive men of both sides are joining hands in the pursuit of common objects; freedom to practice the art of healing in accordance with the conscience of each individual

begins (though tardily) to follow in the wake of freedom in the worship of God.

At least, the truce has sounded; proposals for an honorable peace are under consideration; and, while here and there a "Ku-Klux-Klan" may exist, some doughty old Quixotes still sound their trumpets, buckle on their armor, and start some wind-mill fracas on their own account, the war is virtually over.

At such a time it is natural to look back over the field, number the wounded and slain, and call the roll of the living.

In this battle of the pill with the pellet, of the plaster and potion with the potency, what, on the homœopathic side, has survived the strife, and is to be incorporated into the platform and practice of the future physician?

In discussing this subject, let us first recall what have been the main dogmas of the school of Hahnemann.

1. That *similia similibus curantur* formulates a method of cure which, supplemented by surgery, is applicable to and effective in curing all forms of disease.

2. That in order to obtain a definite and invariable knowledge of the properties of drugs, it is necessary to test their action upon healthy men and animals.

3. That the processes of trituration and succussion develop latent medicinal power in all drugs.

The other tenets of Hahnemann cannot be said to have been held by more than a faction of the school—certainly not within the past quarter century.

Those named we will consider in their order.

Much wordy warfare has been waged over the question whether the Hahnemannic formula embodies a method, a rule or a law. The author himself speaks of it as a mode of cure founded upon what he claims to be a law of nature—*viz.*, that two similar diseases cannot exist at one time in the same body.

Occasionally, both in the Organon and his essays, he employs the word law, but when he comes to strict definition he always

selects the words mode and method. However these terms may have been employed, it cannot be denied that Hahnemann regarded this as the only and universal rule or mode of cure. Attempts at cure in any other way were fallacious, useless, harmful. His condemnation of the therapeutics of his day was severe, contemptuous, almost savage. Nor was his language concerning it undeserved, as all, of every school, will now admit.

For many years the majority of his disciples held to the universality of this *methodus medendi*, with the sole exception made by him, in regard to surgical measures, adding, perhaps, the elimination from the stomach and bowels of poisonous or other offending substances—a proceeding, in its nature, really surgical.

Failures to cure by this method were attributed to the imperfection of the materia medica itself, or to a lack of knowledge thereof on the part of the prescriber. By most practitioners palliatives, such as the employment of narcotics or anodynes, as well as external irritants or emollients, were also admitted. Still, on the whole, the main endeavor of the homœopath has been to find the *Similimum* in his materia medica, and upon it he has depended for the cure of his patients.

But as time has elapsed, the more candid of this school—the broader and freer thinkers—have come to still farther limit the application of the Hahnemannic method. And perhaps no more clear, concise and comprehensive statement of its true sphere has ever been presented than that given by Dr. J. P. Dake, of Nashville, Tenn. Although this may be familiar to most of you, you will pardon a rehearsal of it here.

Dr. Dake entitles it "The Domain of Similia."

"1. It relates to nothing but affections of health.

"2. It relates to no affection of health where the cause is constantly present and operative.

"3. It relates to no affections of health which will cease after the removal of the cause by chemical, mechanical or hygienic means.

"4. It relates to no affections of health occasioned by the injury or destruction of tissues which are incapable of restoration.

"5. It relates to no affections of health the likeness of which may not be produced in the healthy by medicines or other agencies.

"It does relate to all human affections similar to those produced by drugs and other agencies, existing in organisms having the integrity of tissue and reactive power necessary to recovery, the efficient causes of the affections having ceased to operate.

"Looking again, and this time in the direction of medicines and other agencies capable of influencing the human organism as to health, we may say—

"1. That Hahnemann's law relates to the action of no agents affecting the organisms chemically, mechanically or hygienically.

"2. It relates to the action of no agents destroying the parasites which infest the human body.

"Looking over the *armamentarium* of the therapeutist for those agents not thus excluded, we find one class remaining—*viz.*, those agents which affect the human organism as to health in ways not governed by the laws of chemistry, mechanics or hygiene, producing ailments similar to those found in the sick."

No more admirable statement of the sphere of similia has ever been formulated. And yet, in one particular, it appears to me to be inexact. I refer to the relations of our method to what are termed zymotic diseases.

Dr. Dake may claim that, in excluding all affections of health where the cause is present and operative, he covers this ground. And, construed strictly, he does so. But I apprehend that such was not his intention. My impression is that he simply meant to imply (for example) that one could not reasonably expect to cure dyspepsia while the patient persisted in eating indigestible food. But is it not equally true that the homœopathic method is not applicable in the treatment of zymoses?

If whooping cough, for instance, is caused by a fungoid spore, as is claimed, which, entering the mouth, thus infects the system —and if, as is farther claimed, and as I think I have witnessed, this spore can be killed, and the disease cured within a week by the occasional application to the tongue of a little sulphate of

quinine, even after sufficient time has elapsed to render the diagnosis certain; if all zymotic forms of disease are thus caused by germs which enter the body, and derange its healthful action, surely we are to look to germicides, and not to homœopathic treatment, for their cure.

To the effects of such infections our method may be, and doubtless is, appropriate. That is, when the germ has ceased to propagate its kind, when the storm has spent its fury, there remain, of course, a variety of disturbances—even organic changes, perhaps—which have always been enumerated among the essential phenomena of the disease. These, undoubtedly, are in suitable relations with our mode of cure. But just so far as any disease is zymotic, the true aim of the physician must ever be to discover the drug which shall be most destructive to the causative germ, and, at the same time, least harmful to the organism. This having been effectively employed, the results of the disease fall rationally within the domain of general rules or methods of cure.

Genuine zymotic diseases are instances of poisoning, and differ from what are ordinarily so classed only in the fact that in the one the poison is organic, and, in the other, inorganic. This is also true of *sepsis*, and these remarks are intended to include septic infection.

While, in most instances, the germs which produce this class of maladies still remain undiscovered, and the substances inimical to them unknown, the homœopathic is as applicable to their treatment as any other method, but none can be said to be really appropriate.

I would, therefore, exclude from the sphere of similia all forms of true zymosis and sepsis.

This limitation probably disposes of several forms of disease which have always been the *opprobria medicorum* of the homœopathic school. Intermittent fever, syphilis, gonorrhœa, septicæmia, etc.—how many physicians are there hardy enough, foolhardy enough, to attempt the cure of these affections in a strictly homœopathic manner? Who would meet cholera without cam-

phor in sensible doses, the use of which, upon homœopathic grounds, in doses of any size, cannot be defended?

Even so late as 1831, nineteen years after the promulgation of the Organon by Hahnemann, and while he was advising his disciples all over the world to confine themselves to the use of the thirtieth dilution in acute disease, we find him directing that a drop of the tincture of camphor should be given every five minutes in the incipient stage of cholera; that it should be rubbed into the skin freely, and that even two tablespoonfuls of the same should be given by enema. No "thirtieths" for him in this zymosis—for as such he regarded it.

Pardon me if, *apropos* of this, I digress here to remark how the shade of Hahnemann must laugh—or weep—to behold his fanatical worshipers, in the light of the science of this day, bowing at the shrine of the Organon, and burning there the incense of their devotion. A bold and progressive spirit was his while still on earth. Is it less so now? Do they dream that, if he lived to-day, he would republish that Organon as it stands? A wonderful work for the year of grace 1810, to be sure, containing much that is eternally true, but far from the inspired and infallible revelation that these fanatics would make it.

But to resume: If you will investigate the books of our Boards of Health, as I have done, you will become convinced that Homœopathy has little of which to boast in the management of typhoid fever, since the old school has renounced the drugs it once poured down, and has resorted to an almost expectant treatment. If the exhibit appears to be better in scarlet fever, measles, small-pox, etc., I think candid consideration will render it probable that any difference in our favor is mainly due to two things—*viz.*, the persistence of many of the old school in the employment of heavy doses, and the real superiority of the homœopathic method in the sequelæ of these diseases.

If my views of this matter are incorrect, why should the superiority of the homœopathic method be so much more clearly and decidedly evident in pneumonia and other non-zymotic diseases?

In tuberculosis we fail quite as badly as the regular school. But Koch tells us, and with considerable array of demonstration, that here again we have a zymosis.

Time and investigation may prove that some of those maladies now accounted zymotic really are not such. I think, on the contrary, that the field of germ disease is rather likely to widen. But, however this may be, the treatment of such affections must ever remain primarily preventive, antidotal and palliative—homœopathic only secondarily and consecutively.

It is manifestly improper to attempt any argument as to the truth of the doctrine of *similia*. It is not a subject for argument. One might as well argue about the truth of the "rule of three." It is (*first*) a question as to the existence of such a therapeutic rule or law. (*Secondly*), a question as to feasibility in its application. (*Thirdly*), a question as to its rank among the rules or methods of cure. And all these questions can be decided only by experiment, not by argument—by trial, not by discussion. After deliberate, and, so far as possible, unprejudiced trial of all modes of treatment for nearly a quarter of a century, I believe in its existence, in its feasibility as a rule, and in its superiority when feasible. Any physician will thus believe who faithfully tries it after sufficient education in the method to enable him to make a fair experiment.

I have known those who, unskilled in the homœopathic materia medica, and untrained in the proper mode of selecting the remedy, have made hasty and superficial trials and failed to realize their expectations. But never have I heard of a physician who came to the task with suitable preparation, and who gave the method of Hahnemann a fair trial within its legitimate domain, who did not become fully convinced that here he had found what was true, and therefore enduring, in medical art. Such men, as honest, as competent, as judicial in temper as any in the profession, may be numbered by the thousand in the homœopathic ranks. Thousands more, in the old school, are to-day practicing a more or less modified form of Homœopathy. And the advocacy of treatment which will bear no other name,

becomes constantly more frequent in old school journals. The proof is abundant that mere argument in these premises is useless and out of place, but careful and painstaking experiment has always sufficed. Could the entire profession be induced to make such trials and abide by the results, I firmly believe that the essentials of Homœopathy would be universally accepted within a single year.

And, judging from the current course of events, this attitude of mind is beginning to prevail in the profession. Prejudice, *à priori* judgment and blinding passion are being laid aside. And so surely as this occurs, the verity and practical value of the method of similars will meet with general recognition. So much of Homœopathy will be enduring; so much of truth in medical art has been attained, and will remain a part of the living principle of medicine, under whatever name it may survive, under whatever blaze of science medical art may hereafter stand.

The second tenet of Homœopathy is that all scientific treatment of disease must be based upon a fixed and definite knowledge of the properties of drugs, and that such knowledge can only be obtained by experiment with them upon healthy human beings and animals.

Ah! here we have at once the glory and the shame of Homœopathy. Glory—in the truth of the proposition, and the rich fruit already derived from its even partial development. Shame—that in the seventy years since Hahnemann so nobly sacrificed his ease and comfort in this labor, the materia medica has been so little developed. The number of drugs which have been properly and completely proven is, to say the least, very limited, if, indeed, there is one. In the very large majority of instances the provings are meagre, have been most imperfectly conducted, worse recorded, and buried in a heap of unreliable symptoms. And this is the fault and shame of the Homœopathic school.

Still, the realization of a complete materia medica pura, such as Hahnemann inaugurated and his followers have lamely and slowly evolved, is no holiday task.

Think what is necessary to an ideal proving. A sufficient number of healthy men and women, of various temperament, under control as to their diet and habits, of sufficient medical education to express their sensations in proper and accurate language, a laboratory where their excretions can be analyzed, their various organs from time to time examined by experts, and last, and by no means least, competent physiologists and pathologists to sift, interpret and record the results in their proper sequence.

Then the study should be pursued into the pathological realm. Animals should be poisoned by the drug under trial, and thorough post mortem examinations, both microscopic and macroscopic, made. Shall we ever live to see such provings?

And yet upon this pathogenetic basis Homœopathy stands and must stand.

No homœopathic treatment without pathogenesy. No perfection in homœopathic treatment without a perfect and complete materia medica. Some such realization of perfection in proving, some approach, at least, to such completeness, must be attained before the method of Hahnemann can reach its full fruition—before the practitioner can hope or expect to depend upon it alone, even within its limited domain.

It would ill become one who has done so little in this direction as myself to underrate the labors of those who have toiled in this field. Many worthy attempts at proving have been made under the best attainable conditions, and deserve high praise. Among these, those of Hahnemann himself still rank high—perhaps highest. Have you ever tried to conceive the amount and duration of this portion of the work of that noble and masterful mind? Engaged in constant, scientific study; struggling with a poverty unknown to the poorest mechanic of this favored land; overborne in contests with enemies, who were determined to crush him by legal or illegal means; harassed by the care of a rapidly increasing *clientèle*, he yet found time and courage to prove upon himself and his friends upward of fifty drugs, to collate and record the results. And to-day no more accurate and trustworthy provings exist in the materia medica.

You, who have achieved the proving of even a single drug, can best estimate this Herculean labor.

Wonderful man! How eminent was his genius! How manifold his knowledge! How unswerving and persistent his will! How enthusiastic his faith!

Hippocrates, Galen, Hunter, Jenner, Harvey, Louis—each was great and noble; each an ornament to his profession; each in his way and time a gift of God to man. But not one of these had broader and deeper learning; not one had loftier (though different) genius; not one had higher obstacles in his pathway; not one achieved a work of greater benefit to his fellow men. Let the ignorant sneer at and deride his very pardonable errors. The day will never dawn when intelligent physicians shall cease to admire him and honor his memory.

But, it may be asked, why victimize men in tedious and difficult pathogenetic experiment? Why not prove drugs exclusively upon animals, ascertain the pathological changes produced, and reason from this basis?

For several evident reasons: In the first place, animals differ from the human kind in organism, and pathologic facts derived from them can, therefore, never be more than confirmatory and explanatory. Then, animals cannot express their sensations under experiment. Again, lethal doses produce only coarse effects. They cannot bring out the nicer points of a proving, and thus give us symptoms corresponding to the incipience and variety of disease.

But, if this be true, no less so is it that pathogenetic trials upon men demand pathologic experiments upon animals to illustrate, explain, precisionize what is obtained from the former. They complement each other. One, the etching, the outline, which the other shades and colors and makes life-like—both essential to a complete drug portrait.

Similar remarks apply to the records of accidental poisoning. This "harp of a thousand strings" gives but a single shriek when struck by a hostile hand with force enough to demolish

it—it wails in minor and plaintive strains when the strokes are light and repeated.

The only remaining source from which a knowledge of the properties of drugs has been derived is their apparent influence upon the sick. This, and instances of poisoning, have been the sole roots of the materia medica of the old school. On these alone it stood; from these only could it grow. And its history, almost up to the present hour, sufficiently attests the inadequacy and inaccuracy of such sources. Ages of empiricism had partly disclosed the therapeutic relations of a few drugs, such as quinine, arsenic, opium, etc., but knowledge of the most was so imperfect, and opinions regarding their action so contradictory, that their employment in practice was unsatisfactory, uncertain, variable. With every new edition the old materia medica opened its front door to about as many fashionable new comers as were at the same time kicked out at the back door, discarded as useless. Many a rough diamond has been picked up out of their dust-heap, and in the homœopathic workshop polished into a sparkling and priceless gem. But eminent men in the old school have derided its materia medica in stronger terms than even I should be ready to employ. Prof. Holmes, in his oft-quoted address to the Massachusetts Medical Society, only voiced the sentiments of the more candid and judicious among his compeers.

I presume many of you, like myself, have a vague recollection of the "variables" and "constants" that so bothered our youth in the study of calculus. I helped my brother seniors bury that abomination, and it is little of it, thank God, that I remember at this day. But one lesson there inculcated still sticks fast in my memory, *viz.*: that no equation is capable of a definite solution which does not contain at least one "constant" quantity.

So in the problem of cure—given the sick and the medicinal power of drugs, to cure any specific malady—where is the "constant" quantity? Surely not in the sick, and cannot be. And if we cannot render the materia medica a "constant,"

farewell to all thought of scientific therapeusis. Empirics we are, and empirics we must remain.

But such a materia medica, theoretically and hopefully, at least, is that inaugurated by Hahnemann. Once render it accurate and complete (as it surely lies within the scope of human power to do), and, while the nature of drugs and the organism of the body remain invariable, it can never change. This alone can afford an unshakable footing for medical art of whatever variety. Without it all is wavering, uncertain, empiric, unconstant.

Up to the production of Ringer's work, a few years since, the old school materia medica had grown slowly and with difficulty, and therefore his book was received with loud acclaim until the astounding fact was discovered that the most of what was new and true in it had been derived from homœopathic experiments. Then followed Phillips, who borrowed still more freely from the same source.

But to both of these men the profession owes a debt of gratitude. For pride of opinion and blinding self-confidence had rendered the Pharisees of old school medicine insensible to the existence of any territory outside of their own temple. No good out of Nazareth. Broiled upon the homœopathic gridiron, seasoned from its pepper-box, and served in its dishes, they turned with disgust from any food, however wholesome. But frizzled in their own frying-pan, flavored with their own condiments and served up on an orthodox platter, how good was it! how nourishing and strengthening! The entire regular profession became one incarnate "Oliver, asking for more." Thus were they unconsciously taught Homœopathy, and the men of candor and honor among them brought to recognize truths which otherwise might long have remained unaccepted.

To Ringer and Phillips, then, in my opinion, is largely due the wonderful and almost incredible change which, within the past few years, has come over the spirit of the old school, and once brought to the light of novel truth, even by stratagem, they will never disavow it.

This is the second great truth which all must admit has been developed and established by the homœopathic school of medicine. A principle, the discovery and application of which is the crowning glory of Hahnemann and his followers, which is second to no other in medical art, and which will outlast all the mutations of time.

The third named dogma of homœopathy is that by the processes of trituration and succussion, medicinal properties or powers are developed in drugs.

If this proposition refers only to metallic or mineral substances which, in their crude state, are incapable of absorption into the blood, it is accepted by nearly every one of every school. Certainly there can be no doubt that such substances can be thus rendered more or less useful remedies.

But when the idea is extended so as to cover the so-called theory of "potentization" as developed by Hahnemann and some of his followers, its correctness is denied by most of his own school and by everybody outside of it. Certainly the proposition cannot be said by any one to have been proven, and I think it is plainly incapable of demonstration.

The gradual development of this idea in the mind of Hahnemann was a very natural thing, especially so when we consider who he was and the science of the day in which he lived. The crude doses he at first administered in accordance with his new-found method were too powerful. They aggravated the symptoms for which they were given. He reduced them and his patients recovered without such aggravations. He diluted again and again, and still they recovered. And so grew up the idea of "potentization." Once accept the notion that these recoveries were cures, as he did, and some theory had to be invented to explain the supposed facts. Accept the belief that they were recoveries and not cures, and the necessity for any explanation vanished.

When, with our present knowledge, we reflect upon the multitudes that must have been killed by the therapeutic practices then in vogue, and recall the fact that Hahnemann had only

such fatality with which to compare his own much brighter results; when we, even at this day, prate so glibly of cure, and so largely ignore the occurrence of recovery, no one can be surprised that he fell into similar error. Experiment has revealed to us a clearer view of the *vis medicatrix naturæ*, as well as the important influence of other aids in the healing of the sick, and therefore this theory of "potentization" now needs much stronger and more convincing evidence of its correctness.

To me it has always appeared inconsistent to hold that a drug has sufficient power to produce in the healthy organism a certain train of symptoms, and yet, needs "potentization" to enable it to cure a disease presenting similar symptoms.

Nevertheless, I am convinced that some drugs even largely diluted, do sometimes exhibit curative power. Nor do I see any difficulty in admitting this. Surely we have numerous analogies among well known idiosyncrasies. For example, the ingestion of a strawberry is instantly and uniformly followed by an eruption of urticaria. Faintness is produced by the smell of apples. Even the presence of a cat in the room, though unseen and unnoticed, causes asthma, and so on. Such occurrences are not infrequent, and are well authenticated. Why, then, should it be difficult to believe that disease may render at least some organisms susceptible to the curative influence of excessively attenuated drugs?

Such facts, however, afford no argument in favor of the "potentization" theory. They simply illustrate how it may be possible to obtain curative results from exceedingly minute quantities of drugs in isolated and exceptional instances.

But this "potentization" notion involves too many absurdities for a proposition with a truthful basis. For example, when we begin to "potentize," where shall we stop? If the theory holds good up to the "thirtieth," it must be correct *ad infinitum*. Is not this absurd?

Again, if the process of succussion develops power indefinitely, how shall we escape what Hahnemann feared—the development of too great force? Admitting the premises, such a result

would certainly be logical, but experiment proves it chimerical, and reason calls it also absurd.

When the *cui bono* is demanded from "high potency" believers they uniformly claim that, by the aid of infinitesimal doses, they are able to cure disease which would not yield to cruder drugs. Thus they hide in the dark corner where recovery is confounded with cure, and where demonstration, either positive or negative, is impossible. But upon them must rest the *onus probandi*, for they state what they claim to be facts, erect a theory upon them, and call upon the world to accept both.

In view of the absurdities which such a belief involves, the immense majority of physicians of every shade of belief is unable to yield credence to their statements or their theory. We must insist that, in common with many others, they mistake recovery for cure.

Recovery—cure—what do these words signify? In common parlance they are employed as nearly or quite synonymous. Strictly regarded, however, they convey essentially different ideas.

Cure is a restoration to health effected by drug influence, either with or without other aids, but which could not have been accomplished without the help of medicine.

Recovery is a restoration to health achieved without the aid of drugs.

If these definitions are accurate, it is evident that, while theoretically the distinctive difference between recovery and cure is clear, the differential diagnosis in individual cases may still be extremely difficult. And that it is so I need not affirm.

The consequences of this difficulty have been, still are, and, unhappily, will always be, far-reaching and most pernicious. The entire history of medicine is a record of the devious paths through which this will-o'-the-wisp of cure has led the physician into bogs and quicksands. Not a quack ever flourished but boasted his cures. Not a therapeutic theory has been broached but has fortified itself by abundant claims of this sort. Most of the drugs admitted into the old materia medica

have had no other footing there. And only long years of trial suffice to at last reveal the groundlessness of such claims. In the end, surely, the sound judgment of the profession discerns the true and detects the false, accepts the one and rejects the other. But, in the meantime, what doubt, what difficulty, what damage!

But can we practically distinguish recovery from cure in individual cases? I reply, such distinction can be approximated. But to fairly judge such a question, we must ourselves be judicial. We must be ready to recognize that recovery is not only possible but probable—that it may even be the rule, and cure the exception.

Such an intellectual attitude can scarcely be said to characterize the average, and particularly the younger physician. It is only after experience has begun to silver his hair, as a rule, that the doctor begins to distrust his medicines and to transfer the major part of his worship from them to the divine *vis medicatrix naturæ.* His doses which, at first, appeared to work such marvelous cures, have too often proved but a rotten reed instead of a sturdy staff in perilous paths. And this, where he fondly thought he could confidently confide in them. His patients get well or may die in most unexpected and provoking fashions. And, as time wears on, you hear him (if he becomes a wise man) speaking less confidently of cure and more hopefully of recovery.

Thus far as regards the physician—now as to the patient:

Certainty may be at once set down as impossible. Probability more or less strong is all that can be attained by man.

But we may be sure that the more chronic the malady, the less it lies within the boundaries of pure nervous derangement, and the more speedy and decisive the change from disease to health, the more probable is cure. While the more acute the disease, the more purely functional, the more hysterical in character, the more likely is recovery.*

* Out of the one hundred and ten instances of "model cure" given by Hering, in his "Analytical Therapeutics," all but three are cases of hysteria, hypochondria and kindred maladies.

So also, the more accurate our knowledge of the normal course and termination of acute disease, the more surely can we attribute a sudden, decisive and unusual improvement to the influence of a drug recently administered. And yet, on the other hand, one can hardly name an instance of cure in acute disease so quick, so startling and so apparently convincing, that its parallel cannot be found in the annals of recovery.

If we had the recorded results of a purely expectant treatment of sufficient extent and reliability to serve as a basis for comparison, the dilemma would be less perplexing. But even then, so variable in severity and character is disease, so diverse its causes, so inscrutable the influences which environ the sick, that judgment would still remain difficult.

When, therefore, a theory like this of "potentization," which upon its face is improbable, which finds no analogies in science or nature, which involves numerous absurdities, which was invented in credulous times to explain supposed cures—when such a theory appeals for credence to reasonable and properly skeptical physicians with absolutely no proof but assumed cures, it cannot be matter for wonder that few believe it. The real wonder is, that it is still believed by any.

No similar objections lie against the other doctrines of Hahnemann which I have named. It cannot be said that the method of treatment by the *similimum*, the principle of the proving of drugs, the comminution of them by trituration, and the dilution of them to avoid aggravation, involve what is improbable or absurd, or that they find no analogies in science or nature. On the contrary, these theories and practices are eminently rational, demonstrable, and in accord with science and nature—quite as much so as any in medical art.

The convenience and accuracy of the homœopathic methods of trituration and notation have already led to their extensive employment by many not of that school. The same will be true of dilution whenever it becomes evident that doses of less than a minim are necessary or desirable. But the doctrine that by dilution and succussion the power of a drug is developed,

increased, spiritualized, dynamized or made potent to cure disease, cannot be ranked among the "fittest" which are likely to "survive." In fact, so far as I am able to judge from a somewhat extensive acquaintance in the homœopathic school, and from a perusal of its literature, the number of those who accept this theory, and practice in accord with it, is steadily diminishing. Of homœopathic practitioners in general, I am quite sure it is true that they dilute drugs in order to diminish their medicinal power—not to increase it.

It is well to remember that, while this is a theory developed in and peculiar to the homœopathic school, it has no vital or necessary place in its dogmas. Without it, Homœopathy stands just as strongly—nay, even more firmly and symmetrically.

I conclude, then, that the doctrines of Homœopathy which are fundamental and basic, viz., the proving of drugs, the employment of them according to the method of Hahnemann, and the customary manner of preparing these drugs as remedies, are all improvements in medical art which are so valuable that the world will not let them die. They are founded in truth, and that truth is destined sooner or later to universal recognition.

The single fact that they have existed and have gained ever more extensive acceptance for three-quarters of a century is the best of proof that they have truth in them. We must either admit that men are incapable of discovering what is true and valuable in medical art, or those forms of it which have constantly grown in approval, both in and out of the profession, for long periods of time, are by so much proven to be worthy of credence. As optimists, we must believe that, in medicine, as in theology and in law, the calm, keen judgment of mankind is ever discarding the false and accepting the true, and thus ever more nearly approaching ultimate and absolute perfection. Indeed, no other proof of verity in medical art deserves much consideration. No other, aside from that of superiority in practical application, is possible. And, as has been shown, this is largely and necessarily unreliable. Therefore, I repeat, that sturdy and continuous growth is the best evidence

of the truth of these principles and practices. Hampered as they have been by barnacles and excrescences of many kinds; hindered by the vagaries of unwise friends; championed at times by men whose very defense was an injury; assailed with unparalleled ferocity by the prevailing medical sentiment; subjected to every test afforded by the science of the age, including the crucial test of time, they have survived alike the ignorance and fanaticism of friends, and the arguments and abuse of enemies; have won their way little by little, until now they stand on the verge of general acceptance.

This cannot be said of any other attempted innovation in medical art. Hydropathy, eclecticism, mesmerism—isms endless and numberless—have all exerted a more or less slight influence upon the current of medical theory and practice, have had their little day, and settled down to the position which each deserves, or sunk out of sight altogether. Homœopathy alone has steadily and persistently grown. It has greatly limited the abuse of the lancet, and largely reduced the death-dealing doses of former days, thus contributing not a little to the comfort and prolongation of life. Its history is a record rich with direct and indirect benefit to the human race. It deserves the name of the great therapeutic reform of the century and the age.

May we live to see the day when the *materia medica pura* shall have reached its full development; when physiology, etiology and pathology shall have so cleared up what is now obscure that we can rightly interpret disease, understand its causes and its course, and so apply the homœopathic method of cure as to reap its full benefits for mankind.

> "Never the cause that is right shall be buried in ashes,
> Never be lost in the cloud or be sunk in the dust.
> Still from the embers the light of the truth ever flashes,
> Still there is glory ahead for the cause that is just."

At the close of the address, the President received the unanimous vote of thanks from the fellows.

Dr. Lilienthal then read a paper on "Pulmonary Hæmorrhage in Heart Disease, Mitral Insufficiency and Stenosis, Morbus Brighti."

Mr. B. C., fifty-five years old, painter, married, is said to have always led an exemplary life and enjoyed average good health. He is a most hearty Methodist, leads in camp-meetings and enjoys religious exercises. He passed with his family the summer at Ocean Grove, N. J., and worked hard at his trade all day long, and was thus much exposed to atmospheric changes. A company of the Salvation Army also tarried there, and the evenings and nights he passed with them, eager to save sinners and to encourage weak brothers and sisters. About the end of May or beginning of June he began to complain of extreme lassitude, pains in loins and back, loss of appetite and inability to stand the strain on his otherwise robust constitution.

He consulted then a physician at Ocean Grove, who calmed his fears, said there was nothing the matter with him, perhaps some malaria, and advised rest and pretty large doses of quinine.

As he did not improve, the doctor was consulted several times, till finally in September he advised him to come to the city for other aid, as he could not make out what was the matter with him He went to his brother's house, and on September 22d, 1884, our advice was sought for.

Superficial examination of the patient showed considerable dropsy of the lower extremities, penis and scrotum, some ascites. He complained greatly of the weight of his legs, and he begged to be tapped for relief. On account of the twisted contour of the infiltrated penis and prepuce, urination was painful, though not very scanty, as he still passed about a quart of urine in twenty-four hours, and examination revealed plainly the state usually found in chronic parenchymatous nephritis.

As he complained so much of dyspnœa and inability to lie down with comfort, my son, Dr. James E. Lilienthal, examined the chest and was astonished to find so much pericardial effusion that the sounds of the heart could hardly be made out. There was dull percussion sound over a larger area than normal, and it was impossible to distinguish the beats of the heart, and the radial pulse was nearly filiform. The lungs appeared yet clear and the sounds nearly normal. The liver was enlarged,

there were pain and tension in the epigastric region, no nausea or vomiting, but very little appetite, thirst very moderate. His greatest trouble was weakness and the weight of his legs, which prevented him from taking exercise.

September 23d, Dr. L., Jr., scarified his legs and scrotum, and ordered hot applications over them, to be continued day and night (hot water cloths, covered by flannel).

There was considerable difficulty in making a thorough examination, as he was obliged to sit propped up in a chair, and every attempt to change position brought on such attacks of dyspnœa that auscultation of the cardiac region became nearly an impossibility. At times no sound at all could be distinguished, the upheaving motion imparted to examiner's head gave one the idea of a rythm of the heart, but nothing more; at other times a single beat of the heart could be made out, but murmurs could hardly be detected, until the day before his death, when a distinct regurgitant murmur at apex became audible.

About five or six days before his death, he complained of heaviness in the chest, and during the night he had expectorated large quantities of dark masses of blood mixed with mucus, especially at every attempt to clear his throat. Examination showed dullness of left lower posterior part of the lungs, and dullness interspersed with mucous râles at the right lower posterior lung. The anterior portion of both lungs showed, if anything at all, a somewhat increased vesicular breathing. It really seemed during the last day of his life, as if he felt more easy in breathing, but during the afternoon œdema pulmonum set in, and towards the morning hours of the following day he breathed his last.

Digitalis and digitaline, phosphorus and arsenic failed to give any relief, but we have to put down another good mark for convallaria majalis. It certainly reduced greatly the hydropericardium and the discharge from his legs was certainly very gratifying. Another good effect of the convallaria was its action on the bowels, producing a watery diarrhœa, which did not seem

to exhaust the patient. And, as is so often the case, a post mortem was declined; though it would have been very interesting to find out from which organ the disease originally started.

In the discussion that ensued, *Dr. Lilienthal* laid especial emphasis upon the astonishing quantities of blood coagula, which characterized the expectoration as the case approached a fatal termination. He questioned with considerable earnestness the causation of this peculiar symptom.

Dr. Minor cited in brief the history of a case which presented many points of similarity to that narrated by the speaker. There was insufficiency of the aortic valves, due in all probability to antecedent rheumatism. An acute attack came on, similar in nearly all respects to that described in the paper, and was speedily complicated by general anasarca, the accumulation of abdominal fluid being especially pronounced. The employment of digitalis and apocynum cannabinum was followed by satisfactory results. Convallaria majalis appeared to possess no efficacy whatever.

Dr. Lilienthal had used the last mentioned drug in his case with good effect in reducing the ascites, and noted that during its continuance the patient passed frequent and copious watery evacuations. Was not this feature due to the influence of the convallaria?

Dr. Beebe thought not. He had administered it in a large number of cardiac cases, and had never noticed that it possessed any influence whatever upon the action of the intestines. The watery discharges in ascites frequently constitute one of the customary manifestations of the disease, and appear to be one of the methods employed by nature to relieve pressure, or they may be due to the same cause that produces the ascites. The symptom had been present in several cases of extreme abdominal dropsy under his observation. Bristowe, in "Reynolds' System of Medicine," and Roberts, in "Quain's Dictionary of Medicine," refer to the symptom.

Dr. Minor's experience regarding the question of serous diarrhœa in cases of ascites verified that of *Dr. Beebe.*

Dr. Searle had employed the convallaria on many occasions, and had never found it to produce diarrhœa.

Dr. Beebe exhibited a specimen of a bronchial cast, taken from a case of croupous bronchitis, and reverted briefly to the history of the same. The patient was a girl six years old, and three weeks prior to the beginning of the present trouble suffered from an attack of bronchitis, with the customary manifestations. She was ill for two weeks, and at the end of that period recovery appeared to be complete. One week passed, when suddenly, during the night, a suffocative attack occurred, associated with severe cough, which lasted for about an hour. The cast exhibited was expelled with assistance during the paroxysm, and with it came entire relief to the patient. A second cast, imperfectly formed, was expelled twenty-four hours later. The patient is under the influence of kali-bich, and appears to be improving. Reference to the issue of the case will be made on some future occasion.

Dr. Searle referred to a patient who every month expelled, per urethram, a fibrinous cast of one of the ureters. No nephritic trouble existed.

Dr. Allen cited a case which at one time was very well known in this city. The patient, a young girl, for several years coughed up casts of the bronchia at comparatively short intervals. A great variety of remedies had been employed with little or no effect, until some physician had recommended the use of the acetate of lime in the first, second or third trituration. The effect was manifest at once, and now four years have elapsed without the slightest evidence of the presence of the exudation.

The question of the cholera epidemic in Europe then came up for consideration, and *Drs. Searle, Hallock, Fowler, Guernsey, Seward* and *Lilienthal* participated in the discussion. In view of the importance of a more thorough knowledge of the disease, its proper management, and because of the probability of its importation to this country during the ensuing spring and summer, it was deemed advisable for the President to appoint a committee to study the subject in its various bearings, and at some future meeting to present the results of their investigations before the Society.

The President accordingly designated *Drs. Lilienthal, Guernsey* and *Fowler*, to constitute said committee.

Stated meeting, December 9th, 1884.

President Searle in the chair.

The first paper of the evening was read by *Dr. Geo. S. Norton*, on "The Eye as an Agent in causing Headache and other Nervous Disturbances."

Within the past few years, the influence of errors in refraction and weakness of the ocular muscles in producing disturbances in the nervous centres, has assumed more and more importance; all of which is a natural sequence of our increase in knowledge regarding the functions of these organs.

The intimate connection existing between the eye and the brain by means of a nerve of special sense, nerves of sensation and motion, and the blood supply, renders the transmission of an irritation or inflammation in one organ to the other a not unlooked-for consequence. This we see verified in various instances; hyperæmia of the brain will produce congestion in the retinal circulation; tumors in the brain almost invariably cause a "choked disk" or paralysis of one or more of the ocular muscles; and, vice versa, ocular diseases not unfrequently extend to the brain. If this be true regarding inflammatory diseases, how much more certainly should we expect to find symptoms of irritation extending from one to the other. There may not be the same continuity of tissue as is found in the ear, throat and lungs, yet the nerve and blood connection between the eye and brain is closer, and so more conducive to the production of irritation, if not also of inflammation.

The nervous disturbances most commonly brought on by *eye strain* are various forms of headache, particularly in the frontal region, though they may be confined to the vertex, temples or occiput, may be periodical in character, may be accompanied with vertigo and nausea, or may assume almost any variety imaginable. Besides headaches, various mental disturbances may be observed from this same cause, as depression, irritability of

temper and inability to apply the mind; or we may have insomnia, marked indications of spinal irritation, general nervous prostration and even choreic symptoms; all of which will be made more apparent as we proceed.

Let me, however, in the beginning, be not misunderstood and considered as one who is "riding a hobby." This has been done by some oculists, and injury worked thereby. It is mere folly to assume that all diseases, or all nervous affections, or all headaches, or even all headaches of a certain type, may be cured by attention to the eyes; though there is no doubt that a far larger proportion of nervous headaches and other disturbances are dependent upon the eye than the general practitioner usually realizes.

This subject has been one of great interest to me for years, and several thousand cases* have been examined; and it is from this experience that my conclusions will be drawn, and clinical cases given to illustrate the various points brought forward. In this article none of the inflammatory diseases of the eye will be considered, only the effect of errors in refraction and weakness of the muscles in causing the troubles under discussion.

By the term "refraction" is meant that passive power which every eye possesses, when in a state of rest—*i. e.*, adjusted for its far point—of bringing certain rays of light to a focus upon the retina without any effort of the muscular apparatus of accommodation. This power is due to the form of the eye and its refracting media, the cornea, lens and humors.

By "accommodation" is understood the power which every normal eye possesses of adjusting itself for different distances; thus the accommodation is exercised whenever we change our vision from the distant point by looking at an object near at hand. This power of accommodation is due chiefly to the action

* By reference to my records I find that during the past three years over 1,000 cases of errors in refraction have been examined in my office. This with a practice of ten years previous to that time, and the constant experience in a large clinic at the New York Ophthalmic Hospital, will easily make up the "several thousand cases."

of the ciliary muscle, which increases the curvature of the lens, thus enabling it to bring rays to a focus upon the retina.*

In connection with this we must also take into consideration another important factor, *viz.*, the convergence of the optic axes, which is brought about by the action of the internal recti muscles. Now there is a definite relation between the power of convergence, and the power of accommodation—*i. e.*, we cannot converge our eyes, except within certain limits, without also adjusting them for the near point, and vice versa. If anything interferes with this relation, there will be a strain upon one or the other muscle. Like all other muscles the ciliary and internal recti may become weakened by overuse, when all the symptoms of "eye strain" and its consequences will follow.

In the emmetropic eye, parallel rays of light, *viz.*, those emanating from a distance of twenty feet or more, are brought to a focus upon the retina, without any effort of the accommodation; therefore weakness of the ciliary or recti muscles could only be produced by long-continued use at the near point, especially in low states of the general health. If, upon the other hand, the form of the eye varies from emmetropia so that there is a constant and, perhaps, irregular use of the muscles even for distant vision, and thereby an increased action for near vision, very soon we might expect to observe indications of weakness, especially in those whose work demands close application at the near point. The manner in which various errors in refraction produce weakness of accommodation or convergence, will be seen as we proceed.

Before examining into the different errors in refraction, let us first consider how weakness, spasm or irregular action of the ocular muscles can cause headache or other disturbance in the nervous centres. The various muscles of the eye are bountifully supplied with nerves, which preside over muscular action, sensation and nutrition. The nerves of motion are the third,

* I purposely omit here any consideration of the oblique and remaining recti muscles, as their influence in adjusting the eye for the near point is of little practical importance in comparison with the above.

fourth and sixth pairs. The third or oculo-motorius supplies the superior, inferior and internal rectus, inferior oblique, sphincter of the pupil and ciliary muscle. The fourth or patheticus supplies the superior oblique ; and the sixth or abducens, the external rectus. The ophthalmic division of the fifth or trigeminus controls the power of sensation in all portions of the eye, and especially acute is this sense in the ciliary region, owing to the ample distribution of these nerve filaments at this point. Sympathetic fibres will also be found in all parts. It will, therefore, be seen that the nerve connections, motory, sensory, and sympathetic, between the muscles of the eye and the nerve centres, are abundant and intimate. Remembering, now, this nerve distribution, is it at all surprising that a constant, regular or irregular strain on the ocular muscles, week after week, month after month, and year after year, will in time produce headache and various other nervous disturbances by communication of the irritation to other nerve origins? No; it is more astonishing that we do not observe more frequent and more varied complications from eye strain, when we consider the great frequency of anomalies in refraction and the outrageous abuse of the eyes in this intellectual age in which we live.

Having now demonstrated how eye strain will bring about nervous disturbances, let us turn to the various defects of the eye which will cause a strain upon its muscular apparatus.

Hyperopia.—In hyperopia the refractive power is too low, so that, when the eye is in a state of rest—adjusted for distance—parallel rays of light are not brought to a focus upon the retina as in emmetropia, but behind it. An effort of the accommodation is therefore required, even to see objects in the distance distinctly; and how much greater this strain upon the ciliary muscle must be, in looking at a point near at hand, when the accommodation is naturally brought strongly into action. For the emmetropic eye there is a period of rest in viewing distant objects, thus giving time to regain its lost strength after long-continued use at near work, but there is no rest for the hyperopic eye; it must work for distant vision when it should

rest, and must overwork for near vision. Is it, then, to be wondered at that a constant strain is exercised upon the ciliary muscle, which in time will produce various nervous disturbances? The extent of the strain exercised upon the accommodation will depend upon the degree of farsightedness, the amount of work devolving upon the eye, and the general condition of the hyperope. The higher the degree of farsightedness the greater will be the effort of accommodation at the near point, but this does not necessarily hold good for the far point, as they may unconsciously learn to sacrifice a certain amount of distinctness for the advantage of rest. The amount of work is a very important factor in producing asthenopic and nervous symptoms. Steady, long-continued use of an hyperopic eye will invariably, in time, produce eye strain, as will overuse of the muscular apparatus elsewhere cause a corresponding weakness. This is daily demonstrated in our hospital clinics, as the poor seamstresses apply for relief of eye and head symptoms due to hyperopia. Usually, the complaint is only of pain in the eyes and headache over them, after sewing steadily, but occasionally the symptoms become more severe, as in the following:

CASE I.—Agnes M——, aged 17, works at dressmaking from early in the morning till late in the afternoon. She first noticed that the eyes tired on sewing, then a mist would appear before vision about 10 A. M., and continue the remainder of the day; every second day would have a headache over the eyes. These increased in frequency and severity until they came daily at 9 A. M., and continued till night. The pain was severe in the vertex and temples, often shooting in character, and accompanied by nervous spells about 2 P. M. Examination showed: V. $\frac{15}{30}$, Hm. (manifest hyperopia) $\frac{1}{50}$. Also, a small degree of astigmatism. As spherical glasses seemed easier than cylindrical, no attemp was made to correct the irregular curvature, but convex 50 were prescribed. Bryonia was given internally. About a month later she reported that she hardly suffered from headache, and could use her eyes with comfort with glasses. If the headache should

return in this case, it would be necessary to correct the astigmatism also, as is usually done.

Sewing women are not by any means the only sufferers from headaches due to hyperopia, for it is, comparatively, as commonly, or perhaps more often, observed in school children or others who are using the eyes steadily (at the near point) in study or mental exertion. A few cases will give an idea of the symptoms usually complained of by this class of patients, of the low degrees of hyperopia which may produce these symptoms, and of the prompt relief obtained by correction of the error in refraction.

Case II.—Gracie F——, aged 9, was brought to me in December, 1880, for examination of her eyes on account of headaches, from which she had been suffering for three months since returning to school in the fall. The headaches were of almost daily occurrence, and brought on by long study; V. $\frac{15}{15}$, Hm. $\frac{1}{40}$. Convex 40 seemed easier for reading, and so were prescribed, to be always worn while studying. One month later received word that she was perfectly cured, and could use the eyes without producing headache.

Case III.—Lizzie S——, aged 12, had been complaining for some time of headache every afternoon while studying, and also of ciliary blepharitis; V. $\frac{15}{15}$, Hm. $\frac{1}{60}$; as convex 60 appeared easy for reading they were prescribed. The headache was relieved for nearly two months, when it again returned, being severe over the eyes. Examination was now made, after paralyzing the accommodation with atropia, when the whole degree of hyperopia (H.) was found to be $\frac{1}{36}$. Her glasses were exchanged to convex 48, since which time (one year) there has been no return of headache, or inflammation of the lid margins.

Case IV.—Frank E—— applied in January, 1882, for relief of a constant severe headache in the temples, always aggravated by any use of the eyes. He was very nervous; V. $\frac{15}{15}$, difficulty; concave 50 improved distant vision somewhat. There was no manifest hyperopia (Hm.), but the ophthalmoscope showed that the refraction must be hyperopic, thus indicating a spasm

of the ciliary muscle. As convex 40 were comparatively easy to the eyes, they were recommended, and Jaborandi[III]. was given internally. Two weeks later he reported relief from headache, and that he could use the eyes without trouble with glasses.

CASE V.—Esther W——, about 17 years of age, came to me in February, 1884. She complained that for several months she had been unable to use her eyes for reading; any use of them would produce a hot, burning sensation in the eyes, to be followed by a headache over them, like a tight band, with a dull heavy feeling in the occiput. Occasionally there would be shooting pains through the head, and twitching of the eyelids. There was some photophobia, especially by gas light, and the conjunctiva would become injected on reading. She had been treated by her physician for "granular lids." V. $\frac{15}{16}$, Hm. $\frac{1}{48}$. Convex 48 were prescribed for near vision. In a few days it was found that these glasses gave only partial relief from the headache, and that prolonged use of the eyes could not be undertaken, owing to the weakness of the accommodation. Systematic exercise of the eyes, according to "Dyer's method," reading regularly twice a day, commencing in this case with fifteen minutes (her limit), and increasing one minute each day as long as it could be done with comfort, was advised; at the same time electricity was employed, and various remedies, as Con., Ruta, Nux, Bell., and Calc. phos., were administered. She improved steadily and rapidly. In October she wrote that her "eyes had been well all summer;" had used her glasses as directed for near vision; could read an hour and a half without discomfort, and only occasionally suffered from a headache, which could always be ascribed to some definite cause unconnected with the eyes.

CASE VI.—Miss M. D—— was seen in October, 1883. She said that reading ten or fifteen minutes would produce a sharp pain through the right eye, followed by a drawing pain in the head, and headache over the eyes, with occasionally some pain in the occiput. V. $\frac{15}{16}$, difficulty, Hm. $\frac{1}{40}$. Convex 40 were given for near vision, and Ruta administered internally. In October, 1884, she reported that all the head-symptoms had been re-

lieved, and she could use the eyes by day as much as she desired.

CASE VII.—Fred. T——, about sixteen years old, came to my office in September, 1879. He had not been able to use his eyes for several years without producing headache, and for six weeks had complained of marked spasm of the lids on reading. After reading ten minutes there would be aching around and behind the eyes, soon followed by frontal headache. V. $\frac{20}{20}$, Hm. $\frac{1}{40}$. Being satisfied that his hyperopia was really much more than this, convex 50 were prescribed, and systematic exercise recommended. For the spasm of the ciliary muscle Jaborandi was given. Within two months he was able to use his eyes without discomfort, and his headache and nervous symptoms had disappeared. A little over a year later it was necessary to change his glasses to convex 40, but with this exception he has experienced no trouble.

In the above series of cases it will be noted that only those have been selected in which the hyperopia has been of a low degree, and in all of which the vision has been perfect (V. $\frac{15}{15}$ or $\frac{20}{20}$). This has been done intentionally; for they more forcibly illustrate the importance of this error of refraction in causing head symptoms, and therefore the necessity of suspecting it even when the vision is normal. In the higher degrees of hyperopia attention would be sooner directed towards the eyes, as the sight is more or less involved, both for distant and near objects. The train of head symptoms is, however, very similar to those given above, only perhaps more pronounced.

In all hyperopes the constant strain to correct the error in refraction is necessarily chiefly exercised upon the ciliary muscle. This strain will, in some instances, produce simple weakness of the muscle; in others a condition of chronic spasm. The latter is very common, and is a form of "irritable weakness," the muscle being in a state of tension and irritability which especially induces headache and other nervous symptoms. In either condition the correction of the hyperopia is of first importance. Afterwards remedies may be required according to the character of the muscular affection.

The recti muscles are not so frequently involved in farsightedness as in nearsightedness, still their relative strength must often be taken into consideration, as will be shown further on.

The general condition of the patient must not be overlooked; for the exciting cause of the head and nerve symptoms will not unfrequently be found in a poor state of the health. The muscles may have been so strong that they have been able to withstand the extra amount of work laid upon them, until all at once some constitutional disturbance weakens the overworked muscles, and develops the symptoms of eye strain.

Myopia.—Myopia is the opposite condition of hyperopia, *i. e.*, the refractive power is too high, or the antero-posterior axis too long, so that parallel rays of light are not brought to a focus upon the retina, but in front of it. The effort of accommodation is, therefore, even less than in emmetropia, both for distant and near objects, so we would not expect to find headaches arising from overwork of the ciliary muscle. Thus we must ascribe the headaches which are observed, though less often than in some other anomalies of refraction, to some other cause than strain upon the accommodation, as in hyperopia. First, in high degrees of myopia, which necessitate bringing the book nearer the eyes than usual, an extra effort of convergence is required, thus occasioning undue strain on the internal recti muscles, which is followed by weakness of these muscles, with its attendant train of asthenopic, nervous and cerebral symptoms. Second, in the progressive myopia of young people, there will be found congestion of the fundus and even of the whole eye, sensitiveness to light and use, and other symptoms of irritation and weakness which may easily be transmitted to the nerve centres. Illustrative of these varieties are the following cases:

Case VIII.—Miss M. W——, æt. twenty-seven, school teacher, had suffered for years from severe sick headaches. Would be confined to the house (often in bed) for one or two days each week. They usually came on about Friday, after teaching all the week. The pains were intense throughout the whole head, seeming as if they would drive her crazy, and were only relieved by

anodynes. The patient was very nervous and delicate. V. $\frac{6}{200}$. M. $\frac{1}{4x}$ with which V. $\frac{15}{20}$. The fundus appeared normal, with the exception of a very slight posterior staphyloma. The internal recti were weak. Concave 10 were prescribed for constant use, and Jaborandi was given internally. She has been now under treatment about four months, and reports wonderful improvement. The headaches have not wholly disappeared, but are less frequent and less severe; she is stronger, less nervous and sleeps better than formerly.

Case IX.—Ella L——, age about thirteen, came for attention to eyes in April, 1882. She complained of severe pain over the eyes in the head on reading two hours or so. Relief was only obtained by sleep. V. $\frac{15}{200}$, M. $\frac{1}{12}$, V. $\frac{15}{15}$. It was a case of progressive myopia. The fundus was hyperæmic and outlines of optic papilla blurred, though no marked posterior staphyloma could be detected. Concave 18 were recommended for constant use. In October, 1884, she reported herself as perfectly well, could read four or five hours without discomfort, and did not suffer from her former headaches.

Again, in another series of cases, spasm of the ciliary muscle will simulate myopia, and play a very prominent part in the causation of nervous disturbances. These patients may be really myopic, but of a lower degree than is apparent, or they may be emmetropic, astigmatic or hyperopic. This condition must always be borne in mind in myopia, especially when changeable in degree, for it must not be neutralized by correcting lenses, but relieved either by the local use of atropia or the administration of internal remedies, particularly Jaborandi. As examples of spasm of the accommodation, the following cases are cited:

Case X.—Mr. R——, æt. twenty-eight, for seven years had been writing in a poor light all day. He thought his near-sightedness had appeared within one or two years. He complained of the myopia increasing, and the eyes tiring on using them one and a half hours. Fundus normal. V. $\frac{20}{70}$. Concave 40, V. $\frac{20}{20}$. Three weeks after using Jaborandi^{iii}, he reported that he had used his eyes more than usual, and had experienced no

trouble. V. $\frac{20}{30}$. Concave 50, V. $\frac{20}{20}$. Thus proving that we had a case of myopia with spasm of the ciliary muscle.

CASE XI.—Mr. M——, æt. thirty-two. V. $\frac{20}{30}$. Concave 42, V. $\frac{20}{20}$. For nine months had had spots before the vision and aching of the eyes upon using them. In three days, under Jaborandi[III], the vision had become $\frac{20}{20}$, and the muscæ volitantes had disappeared, thus verifying the diagnosis of emmetropia with a simulated myopia from spasm of the accommodation.

CASE XII.—James L——, æt. thirty-two, complained of everything becoming black before the eyes on stooping, aching of the eyes on reading and spots before the vision. V. $\frac{20}{30}$. Concave 42, V. $\frac{20}{20}$. Ophthalmoscope showed slight hyperopia. Three days after taking Jaborandi[III], all the symptoms were relieved, and V. $\frac{20}{20}$.

The influence of regular and irregular spasms of the ciliary muscle will be further considered under astigmatism.

Astigmatism.—This anomaly is one in which the refraction varies in the different meridians of the same eye, and is dependent chiefly upon a variation in curvature of the cornea in its two principal meridians. Irregular curvature of the cornea or lens in more than two meridians is purposely excluded from this classification. Under the term "regular astigmatism" we may distinguish six different forms, viz: simple myopic astigmatism (Am.); simple hyperopic astigmatism (Ah.); compound myopic astigmatism (M. + Am.); compound hyperopic astigmatism (H. + Ah.); mixed astigmatism, with predominant myopia (Amh.); mixed astigmatism, with predominant hyperopia (Ahm.)

Astigmatism will more frequently induce headaches and various nervous disturbances than any other error in refraction. This is, however, no more than we could anticipate, when we remember that the ciliary muscle must act irregularly in the different meridians, thus sooner or later occasioning eye strain with its accompanying symptoms. The eye always endeavors to obtain distinctness of vision, and in small degrees of irregular curvature it may approximately accomplish this result, though at the expense of a strain upon the accommodation. It is remark-

able how small a deviation from the normal curvature will, under favorable circumstances, produce serious eye and head symptoms. Not many years ago, an astigmatism of $\frac{1}{40}$ was considered normal, and not necessary to correct. Now, we know that an astigmatism of $\frac{1}{72}$, or even $\frac{1}{144}$, may occasion very marked asthenopic and nervous symptoms. This is especially true when the degree of abnormal curvature varies in the two eyes, and in different meridians, as is quite commonly the case; for, in these instances, the strain upon the ciliary muscle will be unequal in the two eyes, thus complicating the difficulty. In the higher degrees of astigmatism the patient generally applies for relief early, on account of the poor sight, thus avoiding headache.

Definite knowledge as to the condition of the ciliary muscle is very necessary in prescribing cylindrical lenses; for this muscle may have become so accustomed to acting irregularly that irregular contraction has become the rule and its complete relaxation impossible without artificial aid, thus preventing us from obtaining correct information as to the curvature of the cornea. It is, therefore, very advisable to make an examination after fully paralyzing the accommodation with atropine; particularly is this essential in low degrees of myopic astigmatism.

Let us now consider the different varieties of this error in refraction.

Simple Myopic Astigmatism (Am.) is that state of refraction in which myopia exists in one principal meridian and emmetropia in the other. The influence of this abnormal curvature upon the nerve centres is well demonstrated in the following case:

CASE XIII.—Arthur F——, about seventeen years of age, came to me in September, 1878, complaining of a constant aching in the eyes, aggravated upon reading, also a pain over them after any use, followed by headache, nausea and general feeling of illness. V. $\frac{20}{20}$. No Hm., but as convex sixty seemed easier to the eye, they were prescribed. At that time no test was made for astigmatism, as it was not then thought necessary

when vision was perfect. The above glasses, with Ruta or Nat. mur. internally, gave comparative relief for several months. After which the patient was not again seen until March, 1883, when he once more came, by the advice of his physician, to see if there could be any trouble with his eyes. He stated that he never had wholly been free from attacks of headache, but for the past two months it had been constant, especially in the frontal region. At times it would be severe with nausea and vomiting. It was always increased by use of the eyes or from any mental exertion. He became despondent, sleepless at night, generally "run down" in health, and totally unfitted for his business (mercantile). He had been under the best medical advice, "neurasthenia" diagnosticated, and a trip South recommended. He had taken the last prescription and been to Florida for three or four weeks, but with only slight temporary relief while away, all the symptoms returning in full force on his return to business. Examination now revealed R. V. $\frac{15}{30}$, L. V. $\frac{15}{15}$ difficulty. No improvement from spherical glasses could be obtained. As straight lines did not appear exactly the same in all meridians it was decided to test under atropine, which was to be instilled in both eyes the night and morning before he again came. In a few days he returned with the accommodation fully paralyzed. R. V. $\frac{15}{40}$, L. V. $\frac{15}{20}$; — 40^c axis $90°$ (vertical), R. V. $\frac{15}{15}$, and lines correct in all meridians; —144^c axis $90°$, L. V. $\frac{15}{15}$ and lines correct. After a further test on his recovery from the atropine, "O. D.—48^c axis $90°$, O. S. —144^c axis $90°$" were prescribed for constant use. After wearing these glasses a few days, the headache and all other nervous disturbances had been relieved, even though business had been resumed. Three months later he reported "complete relief from all headache, sleeps well, and general health as good or better than ever;" also that upon attempting, for three weeks, to do without his glasses, indications of his former troubles had returned, which were at once relieved by putting on his glasses again. In September, 1884, he came in to say that

there had been no return of former headaches, wears his glasses constantly and can use his eyes all he desires.

It must always be remembered that spasm of the ciliary muscle will not unfrequently make a hyperopic astigmatism appear to be myopic; it is therefore never safe to prescribe weak cylindrical glasses without an examination under atropine.

Simple Hyperopic Astigmatism (Ah.) is that condition of the refraction in which hyperopia exists in one principal meridian and emmetropia in the other.

Illustrative of the results consequent upon this anomaly of refraction and of the benefit derived from its correction, the following cases are given:

Case XIV.—Mrs. A. C——, æt. 36, dressmaker, was sent to me in October, 1883. For eight months she had not been able to use her eyes with comfort, and had much pain over the eyes in head, especially at menstrual period. Dysmenorrhœa. V. $\frac{15}{15}$. No Hm. She could not at that time have an examination made under atropine, so prescribed convex fifty, which gave some relief. Her headaches, however, increased in frequency and severity, sometimes being constant over the eyes, with nausea, especially in the morning; again there would be a dull feeling extending down the back of the neck; they were always made worse from any use of the eyes, mental worry or excitement. In January, 1884, the test was made under atropine. V. $\frac{15}{30}$. O. D. $+30^c$ axis 90° V. $\frac{11}{15}$ and lines correct. O. S. $+48^c$ axis 90° V. $\frac{15}{15}$ and lines correct. These glasses were prescribed, though not perfectly comfortable at first. Within a few days, however, they were worn with ease and gave relief from all head symptoms. October, 1884, uses her eyes all day without trouble. Does not suffer from the former severe headaches, only occasionally a dull feeling in forehead and vertex from overwork. She only uses glasses for reading or sewing.

Case XV.—Effie H——, æt. fifteen, had been sick for one and a half years from "nervous prostration and spinal irritation." She had received the best medical advice, but had obtained com-

paratively little relief. She suffered from headache and much pain in the back, aggravated by any exertion, physical or mental, and especially by excitement or use of the eyes. On reading three minutes there would be a blur before vision, followed by pain in the eyes, extending to head and back. R. V. $\frac{15}{20}$. L. V. $\frac{15}{15}$. Convex 72° axis 100° made vision $\frac{15}{15}$ in both eyes and lines at first correct; but they soon changed. This was in April, 1884. A further test was then made under atropine, with this result: R. V. $\frac{15}{30}$, +60° axis 95° R. V. $\frac{15}{15}$ and lines correct. L. V. $\frac{15}{20}$, +72° axis 90° L. V. $\frac{15}{15}$ and lines correct. Before recovering from the atropine, these glasses were prescribed for constant use, and she was allowed to return to her home in the middle of the State. In October, 1884, her father wrote me that she was still wearing the glasses constantly, and could read an hour with comfort; also, that "the headache is all gone and her back is a great deal better. It does not ache except when she is tired."

That a still smaller degree of abnormal curvature may cause very decided eye and head symptoms, is shown in the next case.

CASE XVI.—Lucy E——, about seventeen years old, came to my office in November, 1882. For one year had had much pain in the eyes on reading. The eyes were weak, sensitive to light, especially gas light, which caused redness of the eyes the following day. The lids felt heavy, and she desired to close them. On reading even five minutes a blur would come before the vision, to be followed by headache over the eyes. Nearly every afternoon had pain through the temples, coming and going quickly. V. $\frac{15}{15}$, with slight difficulty; + 144° axis 90° made vision $\frac{15}{15}$ and corrected the slight blurring of vertical lines. These glasses were at once given for both distant and near vision. Immediate relief from headache and all eye symptoms was experienced. October, 1884, she wrote that she was still using the glasses, and could not read an hour with comfort without them. No pain in the eyes or headache, unless she neglected to wear her glasses.

One more case under this heading will illustrate the importance of spasm of the ciliary muscle and the necessity of making an examination under atropine.

CASE XVII.—Mrs. B——, aged about thirty, was seen for the first time in August, 1883. Was of a nervous temperament, and had for years complained of headache, painful menstruation and various nervous disturbances. In 1881 an oculist had given her $+ 36^c$ axis 90° ⌒ -48^c axis 180° for right eye, and $- 48^c$ axis 180° for left eye. These had given perfect relief for a year, but when I saw her the old symptoms were returning. There was sharp pain over and behind the eyes, extending into the head; drawing sensation, as if the eye were being drawn back into the head; pain after sleeping; darting pain down the nose; tired feeling in the occiput; some photophobia; considerable nausea and nervousness; print blurred on any attempt to read. Use of the eyes for near vision aggravated all the symptoms, and she was always worse during menses. R. V. $\frac{15}{40}$, L. V. $\frac{15}{30}$. The glasses she was wearing seeming to improve the vision more than any others, a test under atropine was decided upon. After its instillation for twelve hours R. V. $\frac{15}{200}$, L. V. $\frac{15}{70}$; $+16^c$ axis 90° R. V. $\frac{15}{20}$, $+24^c$ axis 90° L. V. $\frac{15}{15}$, and lines were corrected in both eyes. After coming out from under the influence of the mydriatic it was found to be impossible to completely neutralize the irregular curvature, as the ciliary muscle had so long acted irregularly that it could not relax. $+30^c$ O. D., and $+48^c$ O. S., axes 90°, were as strong as could be worn with comfort. These were prescribed for constant use, and after the eyes had become accustomed to them, about five months later, they were changed to $+20^c$ O. D., and $+36^c$ O. S., axes 90°, which have been used to present time with relief from all former symptoms.

Compound Myopic Astigmatism (M. + Am.).—In this form myopia exists in both principal meridians, but it varies in degree. This anomaly of refraction, as can be readily understood, will produce more serious complications than any of the preceding varieties, for we have the "combination strain" from both the myopia and

the myopic astigmatism. The former induces overuse of the internal recti muscles, while the latter, at the same time, causes an irregular action of the ciliary muscle. The following cases will show its importance in the production of nervous disturbances:

CASE XVIII.—Lucy D——, aged eighteen, was sent to me in May, 1884, for examination of her eyes on account of severe headaches. For three or four years she had not been able to study or do any work without producing much headache and pain in the back. For a long time the headache had been constant, but made very much worse from riding in the cars or from any excitement. She was nervous, despondent, and complained of much backache. R. V. $\frac{10}{200}$, L. V. $\frac{15}{200}$. Had been using —10 glasses. Examination revealed a high degree of compound myopic astigmatism, but, as the test was variable, a further examination under atropine was recommended. Two days later it was made with the following result: R. V. $\frac{8}{200}$, L. V. $\frac{15}{200}$; O. D. $-9^s \bigcirc -12^c$ ax. 180°, V. $\frac{15}{50}$, and lines correct; O. S. $14^s \bigcirc -12^c$ ax. 20°, L. V. $\frac{15}{40}$, and lines correct. One week later she reported that her headaches were relieved while under the influence of the atropine, but had now returned, so that she was suffering when in my office. The following were now found to give the most relief and were prescribed for constant use: O. D. $-12^s \bigcirc -12^c$ ax. 180°, O. S. $16^s \bigcirc -12^c$ ax. 180°. Clearness of vision for the lines had to be sacrificed for ease in the left eye by changing the axis from 20° to 180°. Upon using these glasses for fifteen or twenty minutes in my office her headache had nearly disappeared. One month later her mother reported that the result was marvelous. "There had been no headache since wearing the glasses, no pain in the back, and her general health was rapidly improving." The improvement has since continued, I learn.

In this instance all the astigmatism, but only a portion of the myopia, was neutralized. This is usually advisable, but occasionally all the error may be corrected, as in the next case.

CASE XIX.—Mrs. M——, 41 years of age, was seen in June, 1884. She had suffered for many years from headache and

various nervous troubles. About five years ago the following glasses had been prescribed: O. D.—20ˢ ⌒ —36ᶜ ax. 180°, O. S. —12ˢ ⌒ —24ᶜ ax. 180°, for distant vision; and O. D. —30ˢ ⌒ —24ᶜ ax. 180°; O. S. —14ˢ ⌒ —24ᶜ ax. 180°, for reading. These had given great relief until the past year, when her former symptoms had again appeared. She could not read fifteen minutes without smarting, burning and aching in the eyes, pain in the temples and back of the head, with pain extending down the spine to the ovarian regions. There was also nausea upon looking at objects when riding. Menses were early and profuse. The test under atropine revealed the following: V. $\frac{15}{200}$. O. D. —24ˢ ⌒ —20ᶜ ax. 180°, V. $\frac{15}{18}$, and lines correct; O. S. —13ˢ ⌒ —20ᶜ ax. 180°, V. $\frac{15}{18}$, and lines correct. After recovering from the mydriatic, these glasses were prescribed for distant vision and O. D. —72ˢ ⌒ —20ᶜ ax. 180°, O. S. —20ˢ ⌒ —20ᶜ ax. 180°, for near vision. In October she wrote that the headaches and other symptoms were almost wholly relieved, and that she could read for two hours without discomfort. Regular exercise has been followed and Silicea given internally.

Again, it will sometimes be found advisable to only correct the astigmatism.

Case XX.—Mrs. T—— for years had had ciliary blepharitis and tiring of the eyes and head upon reading or sewing. R. V. $\frac{15}{100}$, L. V. $\frac{15}{200}$. Her M. was $\frac{1}{18}$ in the right eye and $\frac{1}{13}$ in the left eye, with Am. in both eyes of $\frac{1}{30}$ in vertical meridian. Under atropine the myopic astigmatism was found to be the same, but the myopia was decreased to $\frac{1}{24}$ in the right eye and $\frac{1}{20}$ in the left eye, thus showing a spasm of the accommodation. —30ᶜ ax. 180° were prescribed for constant use, but especially for reading. One month later she could use her eyes as much as she desired without trouble, and the blepharitis was nearly well. Ung. hydrarg. ox. flav. had been used locally, and Jaborandi administered internally.

Compound Hyperopic Astigmatism (H. + Ah.) is that form of abnormal curvature in which hyperopia exists in both principal

meridians, but more in the one than in the other. This error in refraction is of frequent occurrence, much more frequent than is usually supposed; and many of the so-called cases of simple hyperopic astigmatism would prove to be compound were they examined under atropine. The strain upon the ciliary muscle, which especially gives rise to headaches and nervous symptoms, is more pronounced in this variety of astigmatism than in any of the preceding, for we have the constant over-use of the accommodation from the hyperopia in connection with its irregular overaction from the astigmatism.

As examples of this form of anomaly of refraction the following cases are given:

CASE XXI.—Mr. J. S——, æt. about thirty-five, came to me in October, 1883. For years he had been subject to severe headaches, aggravated by any use of the eyes. About a year previous to his coming to me, cylindrical lenses of +36 O. D., and +48 O. S., had been given and had afforded him partial relief. Still the headaches were severe, especially in the frontal region, and were always aggravated on the day following overwork of the eyes in the evening. The headaches seemed to be congestive in character, with heat and flushing of the face. The pain was sometimes heavy and again "pounding," or sore over the eyes, made worse by motion, noise or light. The eyes, at these times, would feel bruised and sore to touch. Sometimes there would be nausea and faintness. An examination made after instillation of atropine, revealed compound hyperopic astigmatism. The following glasses, which corrected all the astigmatism and nearly all the hyperopia, were prescribed: O. D. $+48^{s} \bigcirc +36^{c}$ ax. 135°; O. S. $+48^{s} \bigcirc +48^{c}$ ax. 45°. Remedies, as Ruta, Bell., Arg. nit., and Gels., were given for a month or so. In October, 1884, he wrote me: "I have little or no trouble whatever with my head. The headaches have ceased entirely since undergoing treatment for my eyes. Of course I have to wear my glasses constantly, but that to me is of small account when I think of those awful headaches. I can truly say that I never felt better in my life."

CASE XXII.—Mrs. V—— had not, for three or four years, been able to use her eyes without pain in them and severe headache. On reading one day would awake the next morning with a pain in the occiput, and a feeling in the vertex as if it was sinking in. On looking steadily there would be aching through the eyeball. The test under atropine was O. D. $+36^{a} \bigcirc +36^{c}$ ax. 90°; O. S. $+36^{a} \bigcirc +36^{c}$ ax. 80° The cylindricals, which only corrected the astigmatism, were advised for constant use. One year later she reported that she wore the glasses constantly with great relief, and that she had suffered from only one headache since wearing them. As the eyes tired soon on reading, $+40^{s}$ were combined with her glasses for reading.

In the above case it will be observed that only the astigmatism was neutralized. This is often advisable in the beginning, though later, when the ciliary muscle has become accustomed to acting regularly, it may be necessary to also correct the whole or a portion of the hyperopia. One case more will show the result of a smaller error in refraction.

CASE XXIII.—Miss S—— came for examination of her eyes on account of periodic sick headaches. The pain was severe every week or so, in forehead and temples, accompanied with nausea and vomiting. Did not complain of eyes, except of a slight aching occasionally after reading one or two hours or longer. The test under atropine made apparent a compound hyperopic. astigmatism corrected by $+72^{s} \bigcirc +72^{c}$ ax. 90°. Convex 72^{c} ax. 90° were prescribed for constant use. Three months later she stated that the glasses had only been worn for reading, but that her headaches were much less severe and less frequent in occurrence.

Mixed Astigmatism is a rare form in which one principal meridian is myopic and the other hyperopic. Two divisions may be made of this class; in one the myopia predominates (Amh.), while in the other hyperopia predominates (Ahm.).

This form of astigmatism naturally gives rise to more irregular action of the accommodation than any other, thus necessarily involving greater eye strain.

One case of each variety will illustrate its influence on the nerve-centres.

CASE XXIV.—Mrs. W—— had been suffering for two or three years from dimness of vision, headache, etc., and had been treated with benefit by an oculist for intraocular troubles. In May, 1884, she came to my office complaining of headache in the occiput with nausea, after long use of the eyes. Often there was pain in the back of the neck extending down the spine. The ophthalmoscope showed some floating opacities in the vitreous, but fundus otherwise normal. R. V. $\frac{15}{70}$, L. V. $\frac{15}{40}$. The test with glasses indicated compound myopic astigmatism, but an examination under atropine was deemed necessary, when the following state of refraction was found: R. V. $\frac{15}{100}$, L. V. $\frac{15}{50}$. O. D. $+40^c$ ax. 90° ⊂ -24^c ax. 180°, V. $\frac{15}{15}$ and lines correct. O. S. $+144^c$ ax. 90° ⊂ -48^c ax. 180°, V. $\frac{15}{20}$ and lines correct. After recovering from the effects of the mydriatic, this prescription was made: O. D. $+48^c$ ax. 90° ⊂ -30^c ax. 180°. O. S. -48^c ax. 180°. These glasses have been worn with comfort and relief from headaches.

CASE XXV.—Mrs. F. S—— had for years suffered from severe periodic headaches and sleeplessness at night. Vision was indistinct, and the eyes tired on using them long. R. V. $\frac{15}{50}$, L. V. $\frac{15}{30}$. O. D. $+48^c$ ax. 115° ⊂ -48^c ax. 25°, V. $\frac{15}{15}$ and lines correct. O. S. $+72^c$ ax. 65° ⊂ -72^c ax. 155°, V. $\frac{15}{15}$ and lines correct. Under atropine the test was: O. D. $+24^c$ ax. 115° ⊂ -144^c ax. 25°, V. $\frac{15}{15}$ and lines correct. O. S. $+36^c$ ax. 65°, V. $\frac{15}{15}$ and lines correct. In this case the former prescription was made, as the glasses seemed more comfortable than the latter, after recovery from the mydriatic. They have given her great relief up to the present time, nearly two years, but have not effected a perfect cure, for she cannot be induced to use them constantly. A change to the latter test will probably be rendered necessary ere long.

Difference in the refraction of the two eyes is of not unfrequent occurrence and requires some consideration. Usually it is the same error but differing in degree; thus there will be

hyperopia or myopia in one eye and the same anomaly in the other eye, only more pronounced. Again we frequently observe cases with hyperopia or myopia in both eyes, and, in addition to this, an astigmatism in one, but not in the other. The difference between the two eyes is not, however, limited to degree, for errors of the most reverse type may be found in the same patient, as myopia in one eye and hyperopia in the other, or simple astigmatism in one and a compound or mixed astigmatism of a contradictory character in the other. But we must not conclude from this variation in refraction of the eyes, that there must necessarily be exercised a greater muscular strain, for the patient will not uncommonly learn to suppress the image in one eye, thereby limiting the strain to the least ametropic eye. Sometimes the difference in refraction is even an advantage; as, for instance, if there is hyperopia in one eye and myopia in the other, they may use the farsighted eye only for distance and the nearsighted one for near vision, thus diminishing the strain to the minimum, and postponing the wearing of glasses to a much later period in life. Binocular vision is not always an advantage, though when it can be brought about with ease to the eyes, our endeavor should be to make the two eyes act together and thus divide the labor and attendant strain. Theoretically it would be advisable to always correct the existing errors in both eyes, but practically it is not usually best to do so.

An almost unlimited variety of differences of refraction of the eyes could be given, but two or three typical cases will sufficiently illustrate the class.

Case XXVI.—Bertha V——, seventeen years of age, had for years complained of headache, and for one year it had been almost constant. The pain was usually dull, occasionally sharp, and especially severe in the frontal region; it was always better when in the open air. She was very nervous, and the general health was poor. V. $\frac{15}{15}$. No manifest hyperopia or astigmatism could be detected. Under atropine, V. $\frac{15}{50}$. O. D., H. $\frac{1}{48}$ + Ah. $\frac{1}{48}$, O. S., H. $\frac{1}{30}$. Ten days after the above test the

following glasses were found most comfortable and were prescribed. O. D. + 72^c ax. 85°, O. S. + 60^s. Nine months later her mother wrote that the glasses had been worn with great comfort, and her general health had greatly improved, notwithstanding an attack of hay fever.

CASE XXVII.—Mabel L—— was brought to me in October, 1884, for indistinctness of vision, pain in the eyes and lachrymation, especially on any reading or studying, together with some headache over the eyes. R. V. $\frac{15}{30}$, L. V. $\frac{15}{50}$. —50^s R. V. $\frac{15}{15}$, —40^s L. V. $\frac{15}{15}$. She was using —48 for distant vision, which gave partial relief, although the eyes seemed to be growing worse. It was also noticed that she held the book much nearer than could be expected in so low a degree of myopia, so paralysis of the accommodation by atropine was recommended. A very material change in the test was then discovered. R. V. $\frac{15}{20}$, L. V. $\frac{5}{15}$ difficulty: + 48^c axis 90°, R. V. $\frac{15}{15}$, and lines correct in all meridians; —144^c axis 180°, L. V. $\frac{15}{15}$ and lines correct. These glasses were advised for constant systematic use, and Jaborandi was given internally. Four weeks later, being then able to read without any unpleasant symptoms, one hour and a quarter three times a day, she was allowed to return to school.

CASE XXVIII.—Mr. B——, aged fifty-five, had, for two years, experienced most intense headaches every week or ten days. They would come on in the morning, and continue until the sun went down. The pain would be worse on the left side, and extend to the occiput; it seemed, as he expressed it, "as if the head would go off," from the severity of the pain. The eyes would tire, and the headache be aggravated by reading or writing. There was a double vision on looking downward and to the right. A concave cylinder combined with a prism for left eye, and simple spherical for the right, had given him some relief one year previous to my seeing him. R. V. $\frac{15}{20}$, L. V. $\frac{15}{30}$. A careful examination revealed hyperopia in right eye, and mixed astigmatism with paresis of the inferior rectus muscle in left eye. It was corrected by the following prescription: O. D. +60^s, O.

S. $+72^c$ axis 45° ⌒ — 144^c axis 135° ⌒ prism 1°, base downwards. To this, for his presbyopia, a $+$ 18^s was added for near vision. One year later he reported that he had had no headaches since wearing his glasses. On account, however, of slight tiring of the eyes, his spherical was changed to 48 and his prism increased to 2°.

Presbyopia.—All our attention has hitherto been directed to errors in refraction which have caused the strain upon the accommodation; but, independent of these errors, we may have disturbances in the accommodation, which will produce cerebral complications. First in order is presbyopia, in which the power of accommodation is diminished by age, as indicated by the recession of the near point, or the desire to hold the book farther away. This is due to senile changes in the lens and ciliary muscle, which render an extra effort of the accommodation indispensable to see near objects distinctly, thus bringing about eye strain. It is a condition that occurs not only in the emmetropic eye, but in all anomalies of refraction. Illustrative of its influence upon the head are the following cases.

Case XXIX.—Mrs. T——, about fifty-five years of age, was seen in May, 1881, for frontal headaches, brought on by using the eyes. Refraction was Em. Pr. $\frac{1}{24}$. Convex 24 were prescribed with relief of headache. In December, 1883, the headache returned. She would awake nearly every morning with pain in the occiput, which would settle over the right eye, with nausea and vomiting. The eyes would smart and burn on reading, soon followed by pain in the head. Rest of the eyes benefited the headaches. Convex 18 were then prescribed, and Sanguinaria given internally. It is now one year and she writes that she has experienced no pain in the eyes or head since last date.

Case XXX.—Mrs. D——, æt. fifty-two, came for treatment in April, 1881. For four years the vision had been growing dimmer and the eyes weaker, so that upon attempting to read even a few minutes, there would be smarting and pain in the eyes, with much nausea. R. V. $\frac{15}{70}$, L. V. $\frac{15}{40}$. Refrac-

tion, Em. Pr. $\frac{1}{14}$. The ophthalmoscope showed commencing cataract in both eyes. Remedies were given to check the progress of the cataracts most of the time, until February, 1883, when R. V. $\frac{15}{40}$, L. V. $\frac{15}{30}$. Still she could not read without great discomfort, even with convex 10 glasses, which seemed correct. The cause of this was found to be weakness of the internal recti muscles. The convex 10 lenses were, therefore, decentered inwards so as to obtain a prismatic effect, and thus relieve the strain on these muscles. They gave immediate relief, and, at this time of writing, she is able to read or write as much as she desires, and with comfort.

A second form of disturbance in the accommodation is a so-called "premature presbyopia," or paresis (weakness) of the accommodation. Here we may find a recession of the near point in early life, or even this may not be apparent, as in the following case:

CASE XXXI.—Mr. M——, a bookkeeper, had for a long time suffered from daily headaches over and behind the eyes, with dull pain in them. He was nervous and languid. No error in the refraction with the exception of a very slight hyperopic astigmatism ($\frac{1}{72}$) in one eye, could be detected, even under atropine. Weakness of the accommodation was diagnosticated, and convex fifty were given for his writing. These glasses gave great relief, but he is still under treatment directed to the "toning up," not only of his ciliary muscle, but also of his general strength. This class of cases may require the aid of glasses for a certain time, but our chief reliance must be placed upon the remedial treatment in the accomplishment of a permanent cure.

The reverse condition of the above is *spasm of the accommodation.* This subject has been well considered in the various anomalies of refraction, so that very little need be said in this connection. Its influence in producing disturbances in the nerve centres has been apparent in a large number of preceding cases. When its origin can be traced to an error in the refraction, this must first be corrected; but often in these cases, as well as in others in which no trouble of this kind can be discov-

ered, more than glasses will be required. It is often here that the local use of mydriatics will render serviceable aid, or we may place our reliance upon internal medication, either specially or generally indicated.

Weakness of the External Ocular Muscles.—It was my purpose to consider in detail the weakness of the recti and oblique muscles in their relation to secondary disturbances, as has been done with the ciliary muscle, but the intended limits of this paper have already been exceeded, so that only a hurried glance can be directed to this division.

The internal rectus is more often at fault than all the others combined. When the asthenopic or nervous symptoms are not relieved after the correction of the existing anomaly of refraction, it should be our duty to carefully determine the relative strength of the external muscles. This can easily be done by an examination with prisms. If one muscle should prove to be unquestionably weaker than normal, it may be sufficient to produce the disturbance of which the patient complains; in which case our attention should be turned to the strengthening of this muscle or relieving the strain brought to bear upon it. Correction only of the error in refraction may suffice to accomplish this object, as has been demonstrated by weakness of the internal recti dependent upon myopia. Again we relieve the tension upon the weakened muscle by decentering the lenses as in Case XXX., or by the addition of a prism as in Case XXVIII. It is not, however, always advisable to diminish this strain, but rather endeavor to tone up the muscle so that it will withstand the increased amount of work devolving upon it. This can often be done by systematic exercise with stronger and stronger prisms, so arranged as to only bring into action the enervated muscle; also by the employment of electricity and internal medication as adapted to the individual case. In some instances tenotomy of the antagonistic muscle is necessary; but these are exceptional cases.

Summary.—In conclusion let me briefly summarize, for the benefit of the general practitioner, the chief points which it has

been my object to elucidate in this article, and also state a few deductions which may be drawn from my experience. Headache in any portion of the head, but especially in the frontal region; headache in which the pain may be of any character whatever; headache severe or mild; headache periodic or constant; headache with or without vertigo or nausea, *may* result from errors in refraction. Various nervous disturbances, as mental disorders, insomnia, spinal irritation, general nervousness, etc., *may* be dependent upon the same cause. The physician now naturally inquires, how are we to know that the cause is ocular indications, and what should lead us to send these patients to a specialist for examination, providing we do not care to make the test ourselves? The following general rules are the only ones that can be advanced: when headaches or other symptoms are made worse or brought on by use of the eyes, even though the aggravation is not experienced until the day following overuse, an examination of the eyes should be made. If asthenopic symptoms are complained of after reading, writing or sewing, even though no direct connection can be traced between these symptoms and the headaches, an examination of the refraction should be advised. In all cases of chronic headaches and cerebral or spinal symptoms in which the causes are obscure and the treatment obstinate, a careful test of the refraction may discover some error, or at least aid in the diagnosis by excluding the eye as an agent in causing the trouble.

To be positive in the diagnosis of anomalies of refraction, an examination of the eyes, when fully under the influence of atropine, is necessary. This test can, however, in the majority of cases, be dispensed with, if there should be any objection to its use. Correction of the faulty refraction is often all that is sufficient to produce a permanent cure. But frequently, upon the other hand, this correction will only ameliorate the condition, and other treatment will be required to complete the cure. This further treatment may consist of regular systematic exercise of the weakened muscle or muscles, the employment of electricity, the administration of remedies for the local disorder,

or, more especially, internal medication directed to the toning up of the whole nervous system. Myopia more often occasions weakness of the internal recti muscles, while the accommodation is more commonly impaired in hyperopia, astigmatism and presbyopia. Astigmatism, particularly, causes derangements in the nerve centres. It is surprising how low a degree of abnormal curvature will, in some cases, produce the most serious complications; and again, it is just as wonderful how high a degree may sometimes be present without developing any indication of eye strain or its consequences. It is not generally advisable to wholly neutralize the full degree of myopia or hyperopia, and even in astigmatism it is not always possible to correct all the irregular curvature, though this should be done as nearly as comfort will allow. Errors in refraction do not as frequently induce secondary disturbances in adults as in young persons, and they cannot usually be as fully corrected in the former as in the latter, for the eye of the adult has become so accustomed to working in an abnormal manner, that irregular action of the muscles has become its normal action, and they (the muscles) cannot at once relax sufficiently to accommodate their action to correcting lenses. Therefore we may meet with a case of headache really due to refractive error, and yet its exact correction will not only not ameliorate, but even aggravate the trouble. In these instances, repeated and careful trials with glasses are very necessary, as oftentimes it will be advisable to only partially correct the error, sometimes to wholly correct, now and then to combine prisms, and again, even an over-correction may be required.

Before closing, let me again say that no claim is made in this paper that all, or even a majority, of headaches, or all headaches or nervous disturbances of any particular type, even though accompanied by asthenopic symptoms and aggravated on reading, are necessarily dependent upon the eyes. I only assert that the eye is a very important agent in causing these secondary disturbances and should be so recognized. The reverse condition is also just as true, that uterine disorders, cerebral or

spinal diseases, and various constitutional troubles, may cause eye complications. The consideration, however, of this latter subject, together with the completion of the one now under examination, by a study of the weakness of the other ocular muscles, and the relation of inflammatory diseases of the eye to cerebral and spinal disorders, must be postponed to future papers, since the intended limits of this article have already been far surpassed.

In the discussion that followed *Dr. Searle* inquired whether the speaker had found that correction of errors in refraction superinduced relief to the manifestations of dysmenorrhea.

Dr. Norton replied that such had been his experience in those instances in which a close dependency existed between the eye symptoms and uterine disturbances. He recalled one case, that of a lady who suffered from ovarian neuralgia, which underwent aggravation at the menstrual epoch. Relief followed the adjustment of proper glasses.

Dr. Searle said that correction of insufficiency of the internal recti muscles could easily be accomplished by the general practitioner, without calling to his aid the customary paraphernalia, and suggested the following plan:

The patient is placed in the upright position, with his eyes fixed upon a spot on a level with the eye, but at some distance from it. He then approaches rapidly the point, until an aching sensation is experienced in the eye. He then recedes, and repeats the operation in the same way several times. Electricity is also recommended as being of the highest service.

The second paper of the evening was then read by *Dr. E. Guernsey* on "The Adulteration of Food."

There is an old saying that supply keeps pace with demand both in the necessities and luxuries of life. If people want, and are willing to pay a fair price for goods, there is but little difficulty in getting thoroughly reliable articles which are in every respect honestly and fairly what they are represented. If, on the contrary, goods are called for at prices less than the actual cost of producing good articles, the demand will be met by

inferior articles. Adulterations, some of them comparatively harmless and others hurtful, will enter into the various articles of consumption. Silk and worsted will be skillfully cheapened by cotton, shoddy will take the place of good reliable cloth, and furniture made of unseasoned wood, cheaply put together with glue and putty, and covered with elegant varnish to conceal the imperfections of workmanship and materials, will take the place of more substantial workmanship. When, in the articles of food, the adulterations are harmless, they may perhaps be looked upon as a kind of necessity to meet the demand for cheap food, but when life and health are imperiled by rendering the products of so uncertain a standard, that it will be impossible to determine their nutritive properties, or when they are combined with ingredients poisonous in their action, legislative enactments are required to protect society. The revelations of the laboratory, as science brings to light one fraud after another, are many and varied. The art of adulteration is now one of the most interesting and skillful departments of chemistry. In days of yore, the worst charge made against the milk dealer was that the pump was his best cow, and the wine dealer was never thought guilty of adding worse than logwood to the liquor he sold as wine. But we are living in a progressive age, and the man who wishes to cheapen his goods can consult systematic treatises on adulteration, in the preparation of which the resources of science have been duly taxed. As we subject the various preparations of food to the test of the laboratory, we find copper in the tapioca soup, and the same metal giving color to the bright green pickles. The fish has perhaps been poisoned with antiseptic salt; the sauce makes it palatable, but very few know what makes the sauce palatable. The butter proves to be margarin improved with gypsum, silicate of potash, sulphate of baryta, potato starch, and coloring matter of various kinds. The truffles are made of earth and potatoes duly flavored. The coffee may contain chicory, beans, corn, carrots, saw-dust and horse liver. The peas and spinach are poisoned with copper. The cigars are made of poor tobacco and cabbage leaves,

and the Lord only knows what enters into composition of the brandy.

In Paris, in 1882, of 3,361 samples of wine presented at the laboratory, the chemists found 702 harmful, 1,093 passable, the only adulteration being water and aniline colors, and only 357 without reproach. In Spain, Italy, Portugal and other wine producing countries, the adulterations are made in the most skillful manner in the countries where the wines are produced.

Legislation, as we have said before, on the matter of adulterated foods, is directed to the protection of health, seldom interfering with those cheapening processes which, so far as health is concerned, are harmless in their character. Let us glance briefly at some of the laws which society has been compelled to adopt to protect itself against the insane desire for cheap goods and their unprincipled manufacturers, closely drawing the line between harmless adulterations and those injurious to public health. As the art of successful adulteration must of necessity steal its secrets from science, it becomes evident that the necessity for employing scientific experts to protect the public against imposition must grow with the advance of science itself, and that in this field of investigation science must meet science and none but the most skilled in chemistry be appointed as public analysts. This is apparent when we consider that the most striking differences as to physical properties exist in some cases, notwithstanding the apparent identity as to chemical composition. Starch, dextrin and wood fibre are all represented by the formula $C_6 H_{10} O_5$, and yet they differ widely one from the other. It is easy, therefore, to suppose that organic substances can be successfully adulterated with other organic substances without fear of detection by ordinary means, but with a material change in quality.

In most of the European countries, laws have long been in existence controlling the manufacture and sale of articles of food. These laws are general or mere police regulations. Upon the English law, which went into force in 1875 and was further

modified in 1879, the laws now enforced in the United States are based. Public analysts are appointed by the local authorities, and are required to analyze a number of samples as fixed upon each year, for which a stated sum of money is paid. Inspectors of nuisances, appointed in the same manner, are required to collect the samples, and if the certificate of the analyst states they are adulterated or sold in violation of the food adulteration law, to make complaint before a magistrate, who will try the case. A portion of the sample is always reserved, to be used in case of appeal. The amount of work done depends on the local government, and is sometimes almost valueless from a lack of enlightened enterprise. In Canada the law is similar to that of England, but being placed under the department of inland revenue, is carried out with much more efficiency. In the United States there have long been in many States scattered clauses relating to the adulteration of food and the sale of dangerous meats, but in 1879 the National Board of Trade proposed a carefully prepared law applicable to each State. This law was passed by several of the States, and is now in active force. It defines what is meant by adulteration of food or drugs; gives the State Boards of Health power to exempt from time to time certain articles, mixtures or compounds recognized as ordinary articles of food, provided they are not injurious to health. The State Board of Health shall take cognizance of the interests of the public health as it relates to the sale of foods and drugs and their adulterations.

The laws, it will be seen, are ample, if rightly enforced, to protect society from the injurious effects of adulteration. In New York the Board of Health by a vigorous exercise of its powers, has almost entirely banished adulterated milk, and compelled the producers to serve it to their customers not below a certain standard of strength. But as disease is often transmitted through milk, the producers should be compelled to transmit to the Board a monthly statement of the health of the cows, the food used, and such other items as are necessary to ensure perfect purity in the supply. In looking at the staple

articles of food used in household consumption, we find the ratio of adulteration about as follows: Spices and condiments, 66 per cent.; ground coffee, 45 per cent.; tea, 48 per cent; sugar, the higher grades almost always pure, the lower grades, 20 per cent.; syrup, 50 per cent.; flour, 9 per cent.; bread, about 2 per cent.; cream of tartar and baking powder, 44 per cent.; butter, 40 per cent.; olive oil, 60 per cent.

Spices are adulterated with exhausted spices, ground cereals, flour, buckwheat hulls, etc.; coffee with chicory, rye and other cereals, also with the shell of the cocoanut, manufactured to imitate the berry; tea with exhausted leaves, leaves of other plants, damaged teas, coated to improve looks; sugar, with grape sugar; syrup, with grape sugar, in many cases all glucose; milk, with water, alkaline salts to neutralize acidity, preservatives, and is often skimmed; cream of tartar and baking powders, gypsum, starches, to increase bulk; butter, other fats substituted for it or adulterated with foreign fats, olive oil, peanut and cotton seed oil. It will be seen that in the adulteration of staple articles, such as are used in every household, the sin is more against the pocket than health, as the articles used in the cheapening process are comparatively harmless.

Oleomargarine and glucose are harmless articles of food, and do not strictly come under the jurisdiction of Health Boards. They require legal supervision simply to compel the producers to sell them for precisely what they are, solely on their merits.

The preparation and sale of canned goods, within the past few years, has grown to an immense industry. It is claimed that almost every variety of fruit and vegetable can be preserved as fresh as when picked from the vines and the trees, and that meat and fish can be kept for months, and even years, in a perfectly fresh and wholesome condition. Fears have been expressed that fruit acids, acting upon the tin, might render the contents of the can poisonous, or that decomposition might take place in meats and fish kept for any length of time in cans. The New York State Board of Health has investigated this matter with the utmost care, and the report of its chemist,

Prof. Lattimore, shows that, in the very large number of specimens of fruits and vegetables examined in 1882, there was in no case any adulteration found. The specimens were also tested for the poisonous salts of lead and tin, and found to be entirely free from them. Some of the articles were canned in 1880. The American canned salmon, which received the first prize of the fisheries exhibition in Boston in 1880, was canned in 1875, and had previously been exhibited and taken the first prize in the Centennial Exhibition in 1876. The competition of canned goods is so great, and the demand is so enormous, that they have really become like flour, a staple article. No respectable dealer can afford to deal in worthless articles; on the contrary, they are urged by every pecuniary consideration to make the standard of their goods as high as possible. Various articles and compounds are daily advertised as preservatives, and are used by dealers and consumers very largely. These consist usually of salicylic acid, often combined with soda, alkaline carbonates, potassium nitrate, borax or boracic acid. It is a question worthy of careful investigation if these articles, though they may check fermentation and putrefaction outside the body, do not, when introduced into the stomach, interfere with digestion, producing gastric disturbance and laying the foundation of future trouble.

Although the amount of adulterated bread used in the United States is only about one per cent., the bake-houses should be subjected to frequent inspection, the danger to the public health arising more from lack of cleanliness than from adulteration. Bake-shops are usually located in cellars, some of them dark and damp, and filled with the foul odors of the sewer. The persons engaged in the preparation of products of the bakery are not always the most cleanly, and it is by no means impossible that disease may be communicated in this way.

Every year we hear of a raid upon the butchers and the markets, in which large quantities of green lamb and veal and unwholesome meat are condemned. The plan is defective, inasmuch as the inspection commences and ends after the meat

is prepared for the market. The slaughter houses should be inspected and the condition and health of the animals carefully noted before they are killed. The experiment of transporting meat for long distances in refrigerator cars or rooms on board of vessels, it seems to me, is worthy of strong commendation and support. The animals can be killed where they are fed, thus preventing the feverish condition and lack of healthy vitality which must necessarily ensue from the exposure and fatigue of long journeys.

It will be seen that law draws the line between adulterations injurious to health, and those not injurious, and intended simply to cheapen the articles sold. Against the former public sentiment has been so thoroughly roused and the powers given to health boards are so ample to detect and punish, that injurious adulterations of food are becoming less and less frequent, while those who are willing to pay for pure and reliable articles can almost always get them.

A brief discussion ensued, in which *Dr. Minor* described the method of *pre*paring and *re*pairing canned goods, and also the method employed in the construction of artificially made honey.

Dr. Sterling read the third paper, on "Conjunctival Diphtheria":

On July 28th, 1884, Joshua Dardon, aged four, colored, presented himself to me for treatment at the clinic of the N. Y. Oph. Hospital. His mother said that about two weeks previously he had recovered from an attack of measles, and that his eye had been sore about one week. An examination revealed the following condition: The upper lid of the left eye was very much swollen, very sore and painful to the touch, with a certain firmness and resistance under the finger, yet not of a board-like hardness; red points, which bleed easily; very difficult to evert, with little whitish flakes here and there. There was a whitish watery discharge exuding from beneath the overhanging lid. On exposing the eye-ball, the cornea was to be seen *very slightly* clouded, and sunken in a pit formed by the swollen ocular conjunctiva. This appeared of a palish waxy look,

glistening, free from vessels, very much as if a layer of slightly soiled cotton had been laid around the cornea and smeared over with some kind of varnish. It could be plainly seen that this was an infiltration into the substance of the conjunctival tissue, and not merely a blenorrhœic discharge lying upon it. The left nostril was totally occluded by a firm whitish membrane, from which was issuing a whitish, watery, acrid discharge, similar to that from the eye. I requested Dr. Schley to examine the throat and nose. The throat was found swollen and hyperæmic, but as yet no membrane upon it. The substance occluding the nostril Dr. Schley unhesitatingly pronounced a true diphtheritic membrane. Drs. Deady, MacBride, Boyle, A. B. Norton, and other members of the hospital staff present that day, saw the case and unanimously concurred with me in my diagnosis of conjunctival diphtheria. The child had considerable fever and seemed very drowsy. I gave some apis, after making arrangements for visiting the child next day, July 29th. On visiting the child in a dirty tenement in East 119th Street, I found him very sick. The pulse was 155. The temperature I did not take, having neglected to bring my thermometer, but should judge about 102. The ocular conjunctiva is more densely infiltrated, overlapping the cornea; membranes are appearing on the edges of the lids. Applied iced cloths to the eye, and ℞ apis and bell., in alternation. On July 30th there seemed to be a slight improvement. The swelling of the lids had lessened and become softer, the edges were cleaner, pulse and temperature both reduced. The cornea remained in about the same condition as at first, and the child had a good appetite. The same treatment was continued.

On July 31st I found an increase of membrane on the edges of the lids, the ocular conjunctiva in about the same condition, but a very decided increase in the infiltration in the cornea, the lower half now being quite cloudy. The pulse had fallen to 120, and the temperature to 101.1. . The child had discharged from the nose a hard yellowish mass, which the mother had thrown into the fire. I changed the ice to heat, prescribed kali-bich. in

solution, just enough to tinge the water. On account of the defective light, the unruly character of the child and the lack of assistance I found it very difficult to properly examine the throat.

On August 1st I found the eye decidedly improved. The second stage, *viz.*, that of vascularization, had set in in the lower half of the ocular conjunctiva. The swelling and tenderness were less. The chemosis less; cornea about the same as yesterday; no membrane on the lids. The nostril was clear and very little discharge. Pulse 120; very little fever. Throat clear. The *pupil* was quite dilated.

On August 2d the improvement in the eye continued. The vascularization had now occurred over the whole ball. The cornea was a trifle clearer. The lids could be separated quite widely, and he opened them himself a little. There was not much discharge from the eye, but a free discharge from the nostril, which had become filled again. This discharge was whitish and watery and occasionally bloody. He had thrown out a number of tough grayish masses. There was an increase in fever, with pulse up to 150. His appetite was good and he desired to be up. Apis and Bell.

August 3d.—About same in all respects.

August 4th.—Ocular conjunctiva is now very red; the swelling is but slight, also much less in lids, which are very tender. Cornea is so infiltrated it looks like a case of parenchymatous keratitis. To-day the throat has a patch on the *right* side. The nostril (left) is again full of deposit. He is very weak and has less appetite. Is a trifle hoarse. Temperature 103.5. Pulse 140. He was given to-day kali-bich. in solution with a little kali-permang., in same tumbler; also merc. prot. in alternation.

For the next four or five days there were slight variations. The eye continued gradually to improve, and the throat would have more or less false membrane deposited on it. There also appeared on the eye-lid small sores, in size from a pin's head to a pea, deeply excavated, with a sort of lardaceous base, discharging matter. These would last three or four days, healing with a cicatrix. They passed in succession from the left eye-lid, down the

face, on to the body and to the limbs, the largest being on the right leg above the ankle and nearly as large as a silver three cent piece.

By August 12th the throat had entirely cleared, and the eye recovered to such an extent I made no more visits at the house. Several times the child showed signs of great depression, when he was put upon stimulants, brandy and milk; but as a rule he had a good appetite through most of his illness. Drs. G. S. Norton and Rounds went with me each once to see this case. After discontinuing my visits at the house, I had him brought to see me at the hospital for some little time. About ten days afterwards paresis of the left side of the face was manifest. I could not detect it below the neck. The haziness of the cornea persisted for some time, but gradually cleared up, so that for all I could tell (being a sulky child, and frequently refusing to answer questions) his vision was unimpaired. The dilatation of the pupil persisted for some time.

Later he began to complain of severe pains in his abdomen, which was sensitive to pressure and gradually enlarging. Dr. Hunt, who frequently saw him with me after he commenced his visits to the hospital, agreed with me that the mesenteric glands were affected. He rather grew worse and finally ceased coming. I do not know the final outcome of the case, but considered the prognosis rather doubtful.

I consider this case rather a peculiar one, and have detailed it for these reasons: In the first place conjunctival diphtheria is an exceedingly rare disease in this country. In the second, the primary manifestations of the disease were in the eye, and secondary in the throat. In the third, the ocular conjunctiva was much more densely infiltrated than the palpebral, while the reverse is most generally the case. In the fourth, not only did the patient recover, but his eye was unimpaired, which is very seldom the case, as diphtheritic conjunctivitis is one of the most fatal diseases that the eye is subject to. In the fifth place, with the exception of some cold applications and some warm, no local measures were used, the patient throughout being treated by

internal medication. It is perhaps proper to say that this case, so far as I can learn, was not exposed to other cases of diphtheria, and I could learn of none having been in the tenement. There were several children in the family, but no others had the disease. One feature struck me as peculiar—the persistent dilatation of the pupil. I account for it as a paralysis of the nerves supplying the constrictor pupillæ, and anticipating the paresis which followed later. I do not remember to have seen this referred to in any article or text book on diphtheritic conjunctivitis. I am somewhat at a loss to explain the succeeding mesenteric affection; whether it may be considered as a sequela of the disease, due to the constitutional effects of the poison, or simply a coincidence in a child of strumous diathesis, possibly hastened in its development by the diphtheritic affection. In regard to the diagnosis, I think it can scarcely be questioned. Every physician who saw it unhesitatingly concurred with me. Bearing in mind the liability of a croupous conjunctivitis to be mistaken for this, I was the more particular to have these gentlemen see the case and express their opinion. I do not propose to weary you with a dissertation on the etiology, pathology and therapeutics of this affection. The modern editions of the text books on the eye deal sufficiently with it, though in regard to therapeutics I would simply remark, it is a very unsettled question. There are no local measures, unless the simple ones referred to, which offer any satisfactory hopes. A case of conjunctival diphtheria must be treated as a case of pharyngeal diphtheria, *viz.*, by constitutional measures. If it recovers you have the same satisfaction you have in the other case—it got well; whether on account of your treatment, or in spite of it, who shall say?

APPENDIX.

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FELLOWS.

T. F. ALLEN, 10 East 36th Street.
Medical Department Univ. City of New York.
1861.
Thesis.
"Critical Examination of our Materia Medica."
N. A. Journ. Hom. (Serial, two years.)

J. F. ATWOOD, 307 Cumberland Street, Brooklyn, L. I.
College Physicians and Surgeons.
1870.
Thesis.
"Remote Effects of Disabilities Sustained in Military Surgery
N. Y. Med. Times, Nov., 1880.

WM. J. BANER, 20 West 47th Street.
New York Medical College.
1858.
Thesis.
"Food and Air."
Unpublished.

CLARENCE E. BEEBE, 21 West 37th Street.
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1873.
Thesis.
"Laryngeal Growths."
Unpublished.

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College Physicians and Surgeons.
1839.

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Edinburgh College of Physicians.
1864.
Dublin College of Surgeons.
1864.
N. Y. Hom. Medical College.
1878.
Thesis.
"Uses of Electricity in Diseases of the Uterus and its Appendages."
North Am. Journ. Homœopathy, May, 1882.

WM. M. BUTLER, 393 Gates Avenue, Brooklyn, L. I.
College Physicians and Surgeons.
1873.
Thesis.
"Melancholia."
Medico-Chirurgical Quarterly, July, 1881.

WM. BRYAN, West New Brighton, Staten Island.
Med. Dept. Univ. City of New York.
1880.
Thesis.
"The Two Most Common Affections of the Knee Joint."
Unpublished.

L. DENNIS, Newark, N. J.
College Physicians and Surgeons.
1866.
Thesis.
"The Physician's Duty in Reference to the Instruction in our Public Schools."
Fifth Annual Report N. J. State Board of Health, 1881.

GEO. M. DILLOW, 102 West 43d Street.
College Physicians and Surgeons.
1875.
Thesis.
"Glycosuria and Diabetes as Interpreted by Experiment and Physiology."
North Am. Journ. Hom., Aug. and Nov., 1880.

S. J. DONALDSON, "The Chelsea," West 23d Street.
Jefferson Medical College.
1870.
Thesis.
"Contributions to Gynecology."
Book form, 1882.

EDWARD P. FOWLER, 10 East 41st Street.
New York Medical College.
1855.
Thesis.
"Malaria."
Unpublished.

EGBERT GUERNSEY, 526 5th Avenue.
Medical Department Univ. City of New York.
1846.
Thesis.
"Puerperal Convulsions."
Unpublished.

LEWIS HALLOCK, 34 East 39th Street.
College Physicians and Surgeons.
1826.

WM. TOD HELMUTH, 299 Madison Avenue.
Hom. Med. College of Pennsylvania.
1853.
Thesis.
"Supra-pubic Operation for Stone in the Bladder."
Book form, 1882.

W. S. KIMBALL, Eatontown, N. J.
Lexington Medical College of Kentucky.
1853.
N. Y. Hom. Medical College.
1863.
Thesis.
"Diabetes Mellitus."
Unpublished.

MALCOLM LEAL, 154 West 34th Street.
N. Y. Hom. Medical College.
1879.
Thesis.
"Toxic Action of Arsenic, with Special Reference to its Localization in the Brain."
Medico-Chirurgical Quarterly, October, 1881.

SAM'L LILIENTHAL, 228 West 34th Street.
University of Munich.
1838.

ROB'T MCMURRAY, 234 2d Avenue.
Western College of Physicians and Surgeons.
1840.

H. B. MILLARD, 4 East 41st Street.
Medical Department University City of New York.
1858.
Thesis.
"Bright's Disease."
Unpublished.

JOHN C. MINOR, 10 East 41st Street.
College Physicians and Surgeons.
1865.
Thesis.
"Contributions to Practical Surgery."
Unpublished.

E. V. MOFFAT, 149 West 44th Street.
N. Y. Hom. Medical College.
1879.
Thesis.
"Sclerosis of the Posterior Columns."
Am. Journ. Electrology and Neurology, Jan. and April, 1881.

J. L. MOFFAT, 17 Schermerhorn Street, Brooklyn, L. I.
N. Y. Hom. Medical College.
1877.
Thesis.
"Cystitis."
Unpublished.

GEO. S. NORTON, 154 West 34th Street.
N. Y. Hom. Medical College.
1872.
Thesis.
"Keratitis Parenchymatosa."
N. A. Journ. Hom., May, 1882.

HENRY D. PAINE, 26 West 30th Street.
College Physicians and Surgeons.
1838.

W. M. PRATT, 204 East 15th Street.
N. Y. Hom. Medical College.
1861.
Thesis.
"The Human Mind Physiologically and Pathologically Considered."
Medico-Chirurgical Quarterly, April, 1881.

E. GUERNSEY RANKIN, 51 West 50th Street.
Medical Department University City of New York.
1878.
Thesis.
"Historical Table of Supra-Pubic Lithotomy."
Published in Helmuth's Work on "Supra-Pubic Lithotomy."
1882.

JAMES M. SCHLEY, 1 East 42d Street.
Medical College of Savannah.
1872.
Thesis.
"Mercury and its Amalgams in Diphtheria."
The Homœopath. (Date unknown.)

WM. S. SEARLE, 132 Henry Street, Brooklyn, L. I.
University of Pennsylvania.
1859.
Thesis.
"A New Nervous Disease."
Book form, 1881.

CHAS. F. STERLING, 152 West 34th Street.
Pulte Medical College.
1877.
Thesis.
"Anatomy of Choroid, with a Description of its Plastic and Parenchymatous Inflammation."

SIDNEY F. WILCOX, "The Rutland," 57th Street and Broadway.
N. Y. Hom. Med. College.
1880.
Thesis.
"Cancer of the Stomach."

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SELDEN H. TALCOTT, Middletown, N. Y.
N. Y. Hom. Medical College.
1872.
Thesis.
"Mania."
Trans. N. Y. State Hom. Med. Society, 1881.

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